

# Deployment Planning and Automation Solution from Rational and Tivoli

Daniel Berg - Rational Software



**PCTY2011** 

Pulse Comes to You

**Optimising the World's Infrastructure**

## Please note:

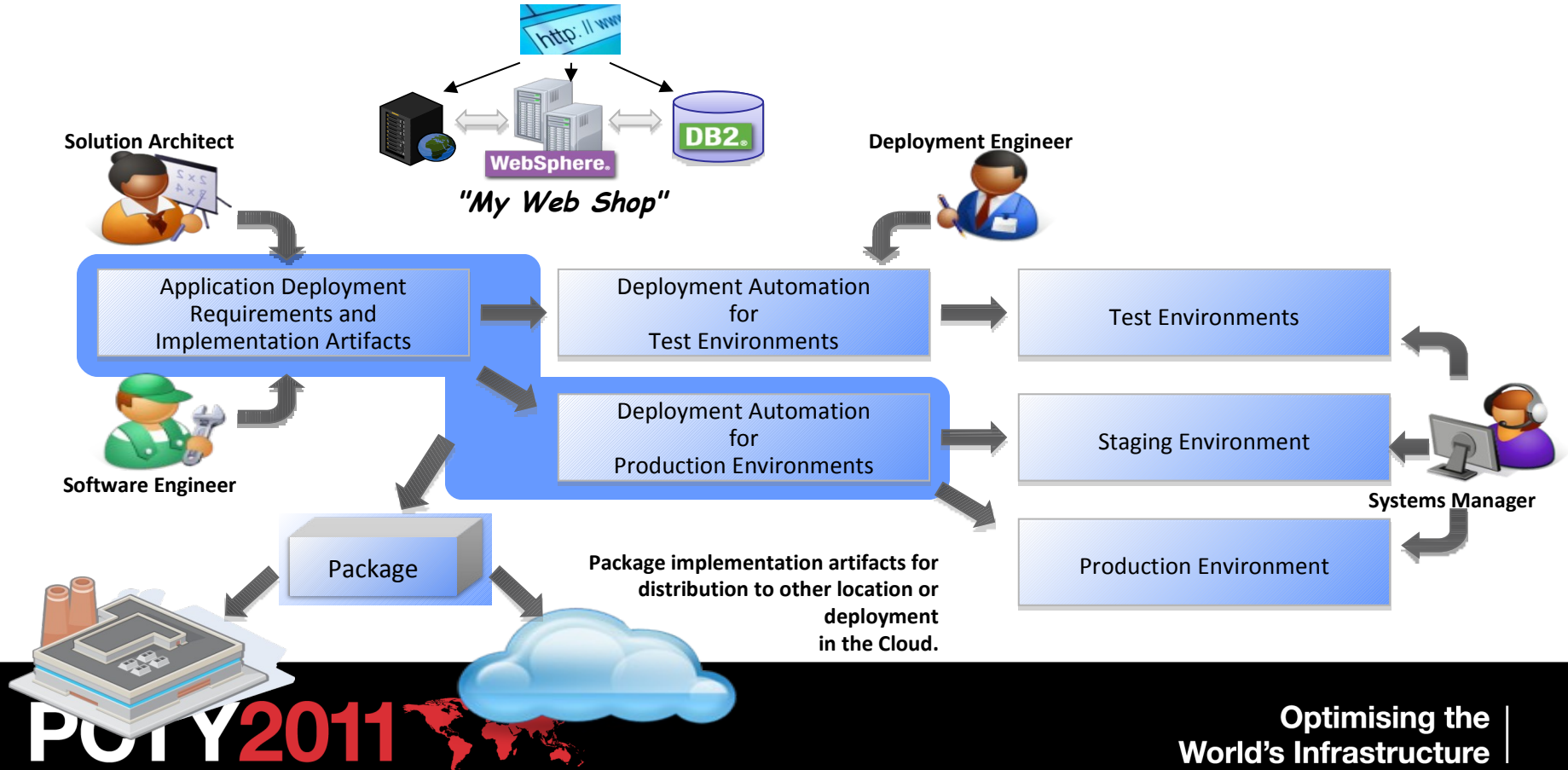
- IBM's statements regarding its plans, directions, and intent are subject to change or withdrawal at IBM's sole discretion. Information regarding potential future products is intended to outline our general product direction and it should not be relied on in making a purchasing decision.
- The information mentioned regarding potential future products is not a commitment, promise, or legal obligation to deliver any material, code or functionality. Information about potential future products may not be incorporated into any contract. The development, release, and timing of any future features or functionality described for our products remains at our sole discretion.

# Agenda

- The Problem
- The IBM Solution
- Demo
- Summary

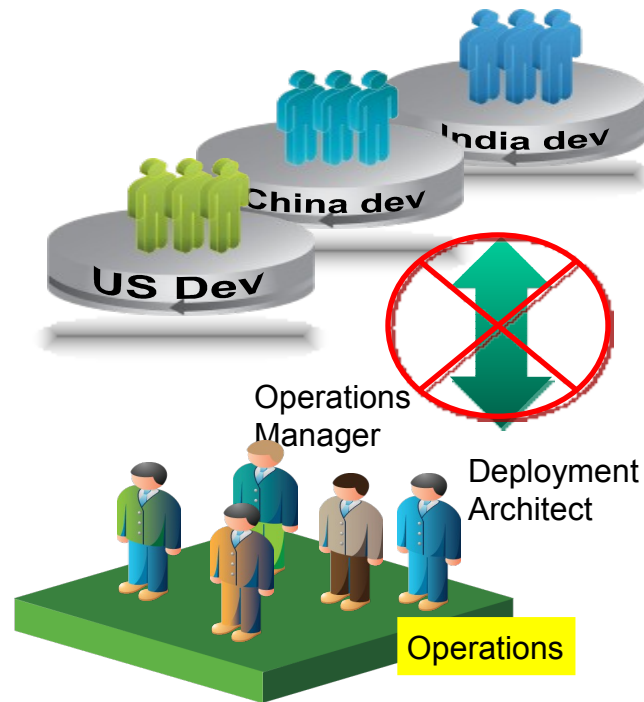


# Example Scenario



# Deployment is a Complex Problem

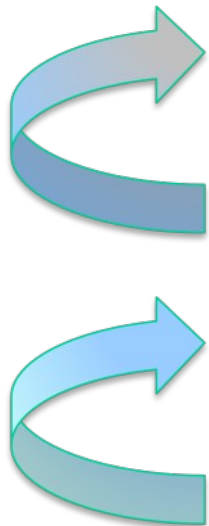
- **Development and Operations teams collaboration challenges**
  - Hand-off from development teams is inconsistent and manual
  - Application component requirements do not match IT infrastructure
- **Deployment requirements are difficult to validate**
  - Enterprise, Software & IT architects all use different formats
  - No standardization or templates for reuse
- **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



- ✓ 50% of applications put into production are later rolled back (*Gartner*)
- ✓ 60% - 80% of an average company's IT budget is spent on maintaining existing applications (*Intelligent Enterprise.com*)
- ✓ Software related downtime cost industries almost \$300 billion annually (*CENTS - Comparative Economic Normalization Technology Study*)

# Variability During Development Lifecycle

Standardize & Simplify



## ***Quickly Changing Stuff***

- Example: The component(s) under development
- Impossible to standardize the bits
- Desirable to standardize the deployment automations

## ***Stuff with unknown change rates***

- Example: OS, Middleware, dependent components
- Reasonably easy to automatically deploy
- High variability hinders automated deployment *of the next level*

## ***Slowly Changing Stuff***

- Example: the processor architecture
- Easy to standardize
- Easy to automatically deploy
- Because this is standard, it is easy to automate deployment *of the next level*



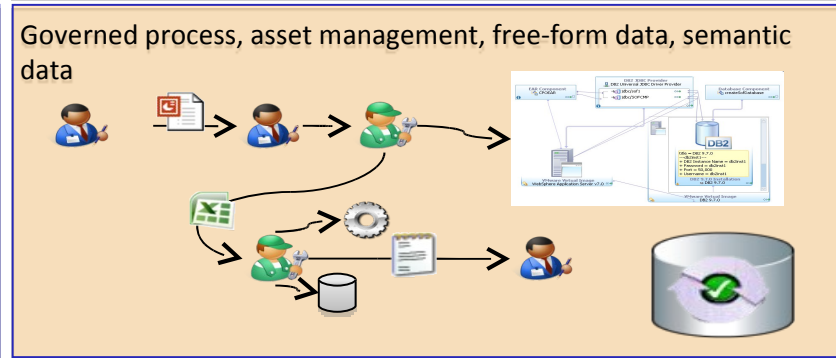
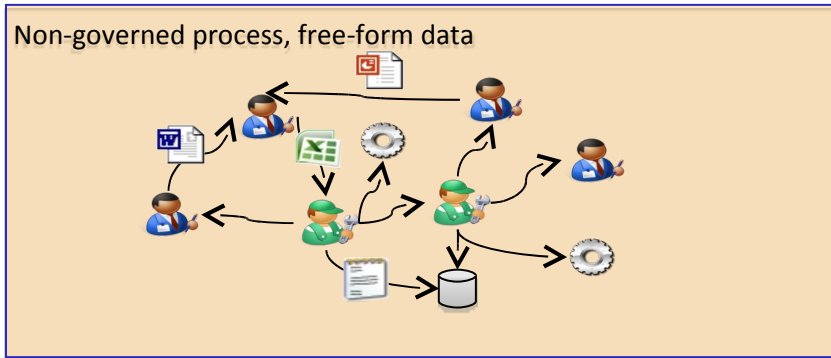
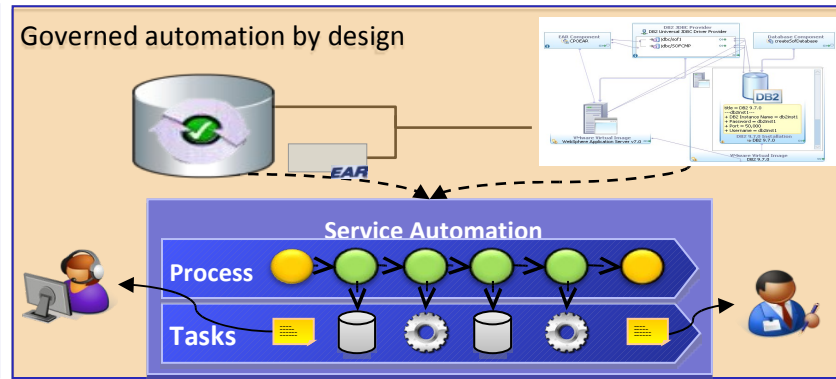
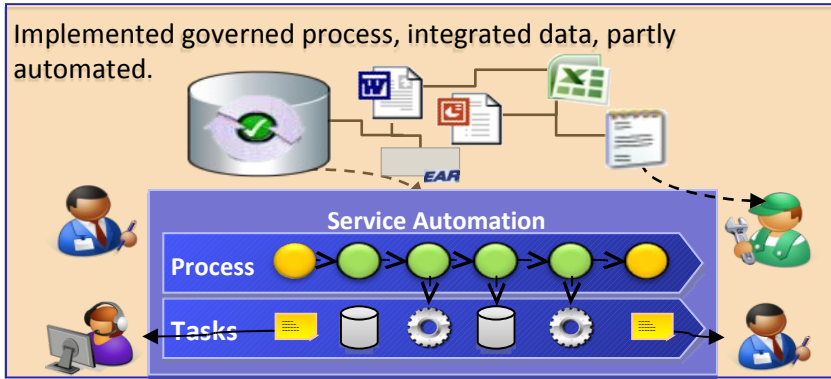
---

# The IBM Solution

Integrated Rational and Tivoli tools

# Introduction of Service Automation is an Evolutionary Process

derr evo G



Governed Planning



# IBM Deployment Planning and Automation

## An Integrated Solution

- **Plan** composite application deployments using organizational standards
  - Reduce time and errors
  - Improve communication
- **Automate** infrastructure provisioning, middleware configuration, and application installation
  - Repeatedly setup standardized environments
  - Remove costly manual errors
  - Reduce provisioning times
- **Govern** and application artifacts, standards, and deployed resources
  - Adhere to organizational standards



# Scenario



## Application Architect

Describe the topology that captures the deployment requirements for a composite application.

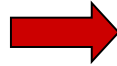
Would love to

- Reuse known good plans and assets
- Discover existing resources vs guess

Deployment Plan



Application Artifacts and Templates



Plan and create workflows



Provision platform and install/configure application

## Deployment Engineer



Defines environment media, creates building block workflows, creates service definition and associated management plans

## Deployment Environments



Physical Hosts

Or



Rational



Portal



DB2



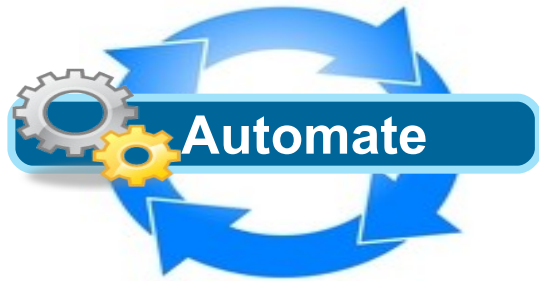
WAS

Virtual Host

Or



Cloud

Two screenshots of software interfaces. The top one is IBM Build Forge showing a table of build jobs. The bottom one is Tivoli Service Automation Manager showing a dashboard with various management options.

| Tag      | Project   | Status   | Message | Date                | Runtime | Owner     |
|----------|-----------|----------|---------|---------------------|---------|-----------|
| BUILD_10 | Project 1 | Complete | ✓       | 2006-06-20 14:06:27 | 0:05:20 | Root User |
| BUILD_9  | Project 1 | Complete | ✓       | 2006-06-20 16:12:04 | 0:26:28 | Root User |
| BUILD_8  | Project 1 | Complete | ✓       | 2006-06-20 16:11:48 | 0:26:28 | Root User |
| BUILD_7  | Project 1 | Complete | ✓       | 2006-06-20 16:11:42 | 0:41:46 | Root User |
| BUILD_6  | Project 1 | Complete | ✓       | 2006-06-20 16:11:24 | 0:05:24 | Root User |
| BUILD_5  | Project 1 | Complete | ✓       | 2006-06-19 12:09:57 | 0:05:05 | Root User |
| BUILD_4  | Project 1 | Complete | ✓       | 2006-06-19 11:58:51 | 0:00:01 | Root User |
| BUILD_3  | Project 1 | Complete | ✗       | 2006-06-19 11:57:31 | 0:00:01 | Root User |
| BUILD_2  | Project 1 | Complete | ✗       | 2006-06-19 11:54:46 | 0:00:01 | Root User |

**Tivoli Service Automation Manager**

- Backup and Restore Server Image
- Manage Image Library
- Manage Users
- Modify Project
- Modify Server
- Cancel Project
- Create Project with System p LPAR Servers
- Create Project with VMware Servers

# Tivoli Service Automation Manager's Approach for IT- and Cloud Service Management

## Roles and Responsibilities

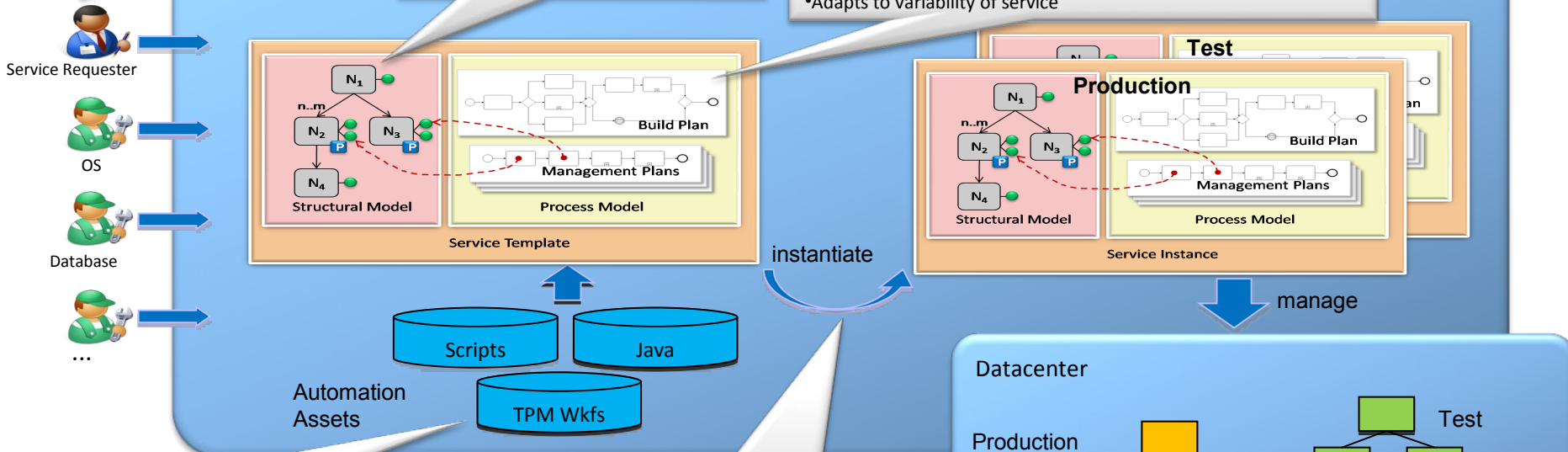
- Role-based access to model
- Role-based tasks

## Service Templates

- Structural model and management process model
- Including points of variability

## Management Plans

- Best-practices process model for instantiating, managing and terminating services
- Defines process and data flow
- Adapts to variability of service



## Automation Assets

- Plugged into management plans
- Integration with TPAe-internal automation tools (e.g. TPM)
- Integration of custom scripts

## Parameterized Instantiation

- Fill in points of variability
- Select options
- Bind to concrete resources

PCTY 2011

World's Infrastructure |

# Tivoli Service Automation Manager implements a holistic Model for Service Lifecycle Management

## (1) Service topology templates capture IT- and Cloud Service reference architectures

- Service as a composition of its components, and their relationships and dependencies
- Configuration templates and allowed variations
- Including non-functional aspects and policies



## (2) Integrate structural and management process models enable architecture-compliant automation

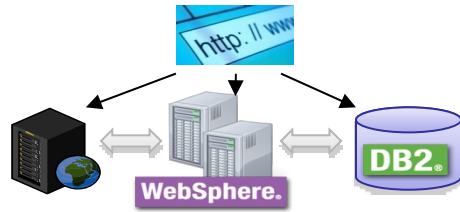
- Management processes as an orchestration over service components, invoking operations on service components
- Including integration into surrounding enterprise processes

## (3) Service lifecycle management

- Initial deployment of services
- Operational management of services

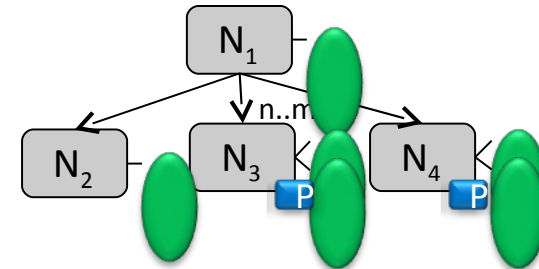


# The IT Service Lifecycle Supported by Our Concepts

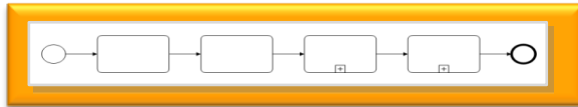


IT service to be managed with specific solution- and deployment architecture

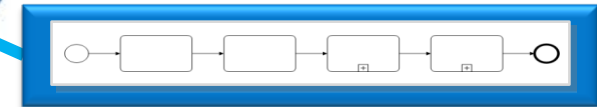
Design guidelines and programming models, integrated platform tooling



Service Template executable by service management runtime, capturing solution- and deployment architecture including variation options

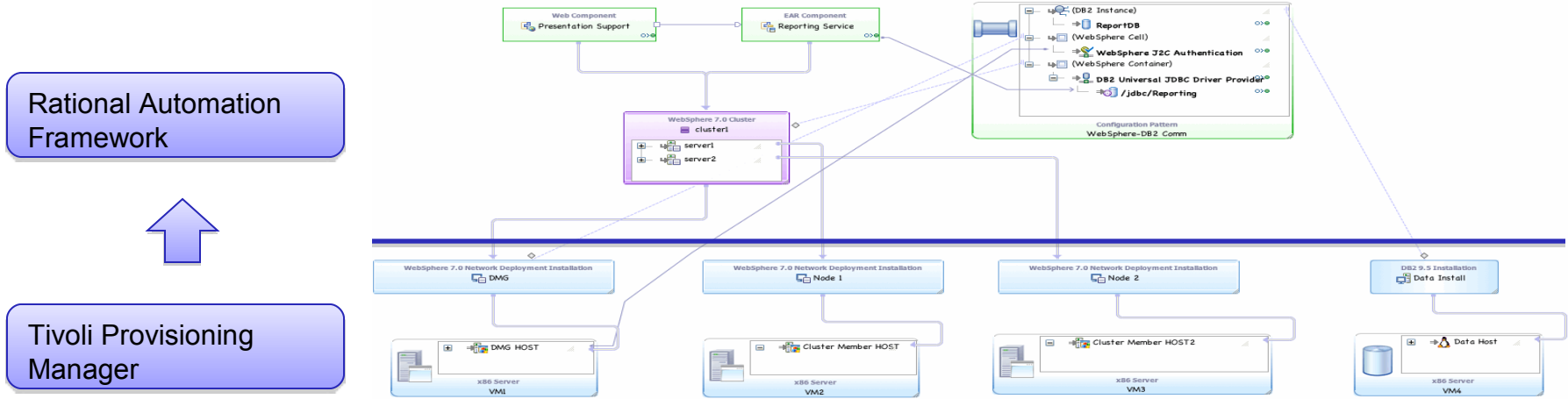


Management process model for the operational management of deployed service instances



Management process model for the template-based instantiation of service deployments

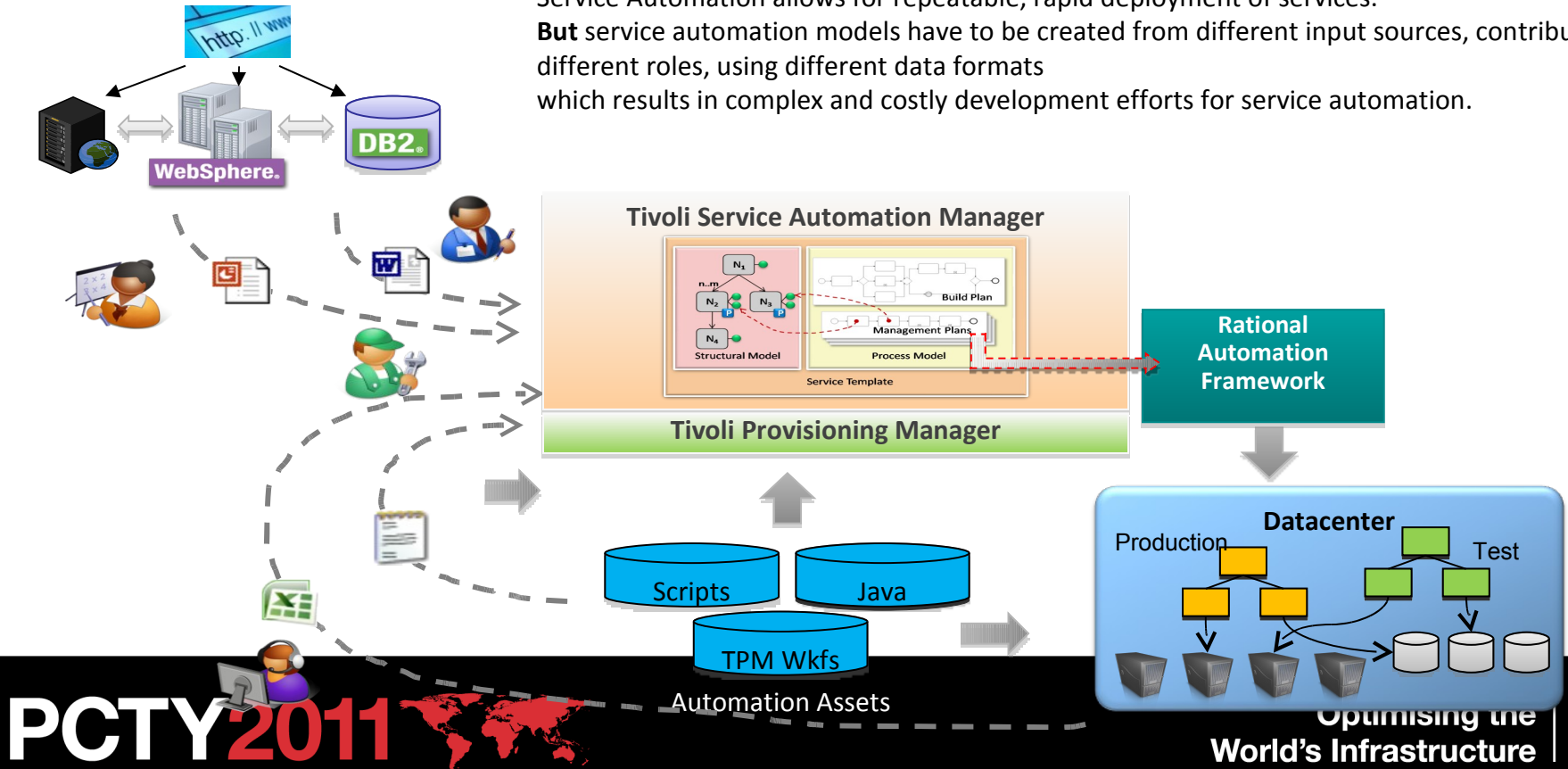
# Tivoli Provisioning Manager and Rational Automation Framework Positioning



Rational Automaton Framework package available on Integrated Service Management Library to integrate TPM workflows with RAF workflows

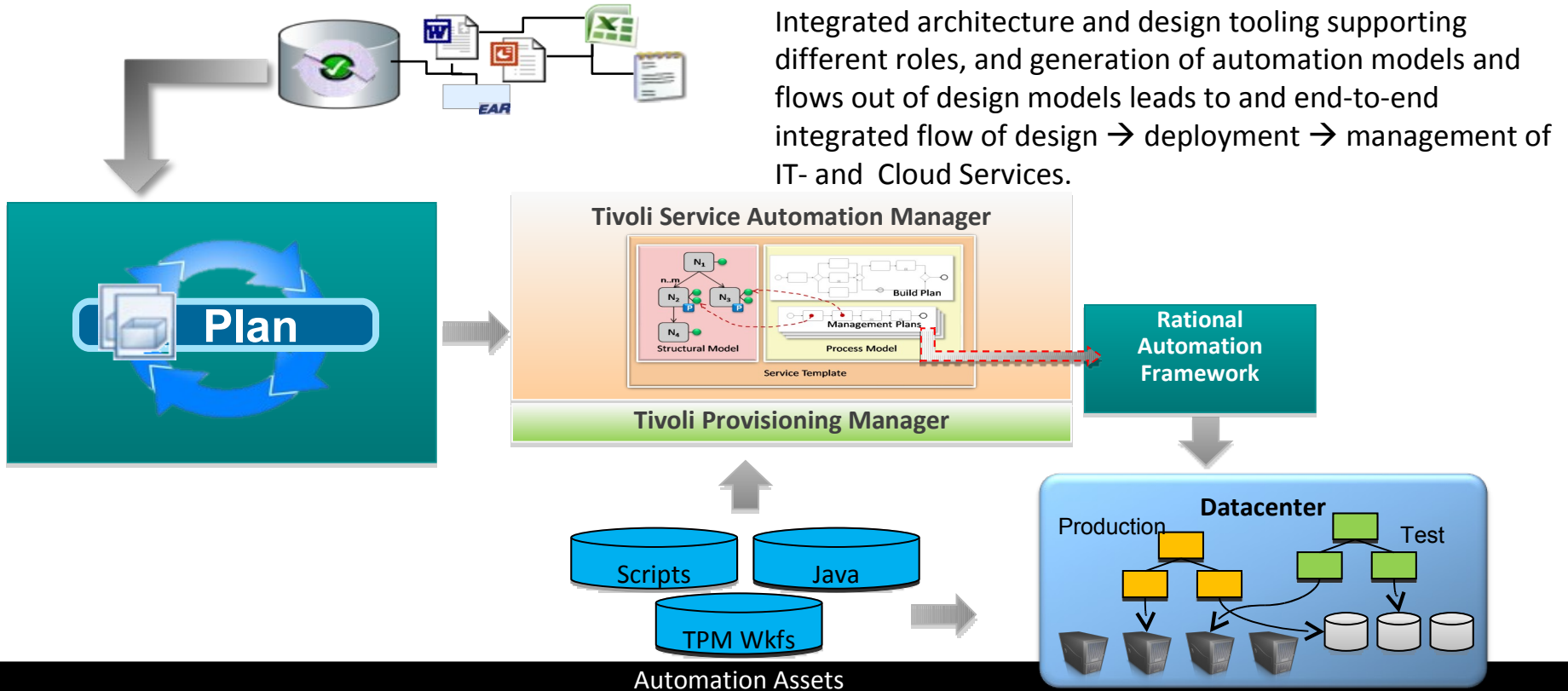
# The Remaining Challenge...

Service Automation allows for repeatable, rapid deployment of services. **But** service automation models have to be created from different input sources, contributed by different roles, using different data formats which results in complex and costly development efforts for service automation.

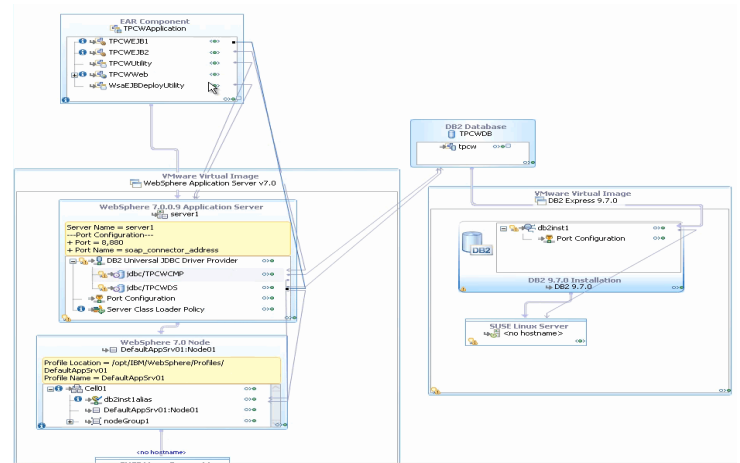




# Automation by Design as the Next Step



Integrated architecture and design tooling supporting different roles, and generation of automation models and flows out of design models leads to an end-to-end integrated flow of design → deployment → management of IT- and Cloud Services.



# Rational Software Architect

## • Smarter IT Deployment Planning

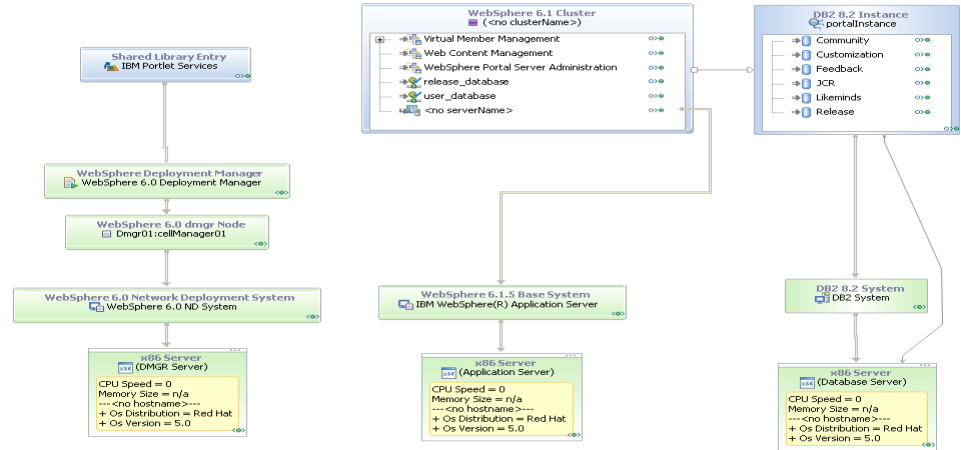
- Communicate and validate IT deployments to avoid costly problems late in the application lifecycle

## • Deployment Template Design and Reuse

- Capture and reuse organizational standards to quickly and easily plan deployments

## • Datacenter Discovery

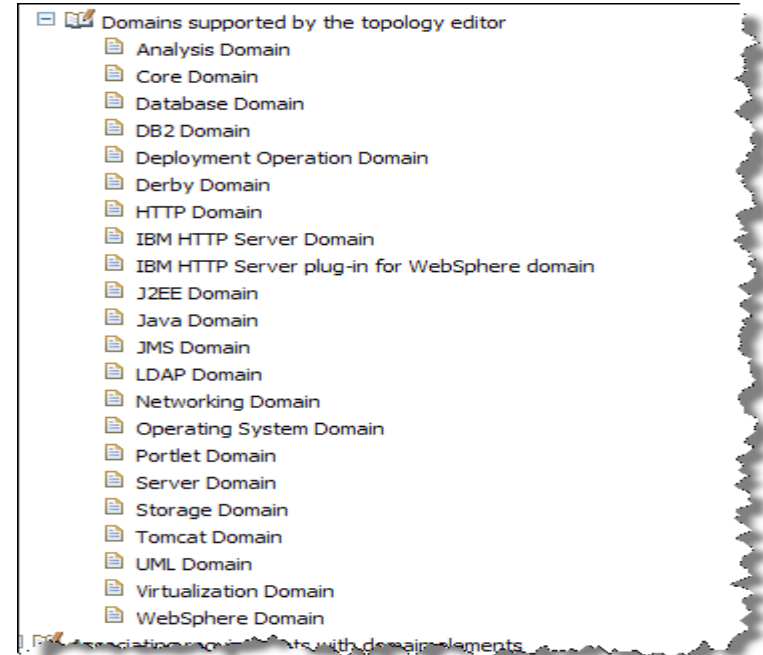
- Quickly construct a topology describing what you have in your infrastructure



RSA Extension for Deployment Planning

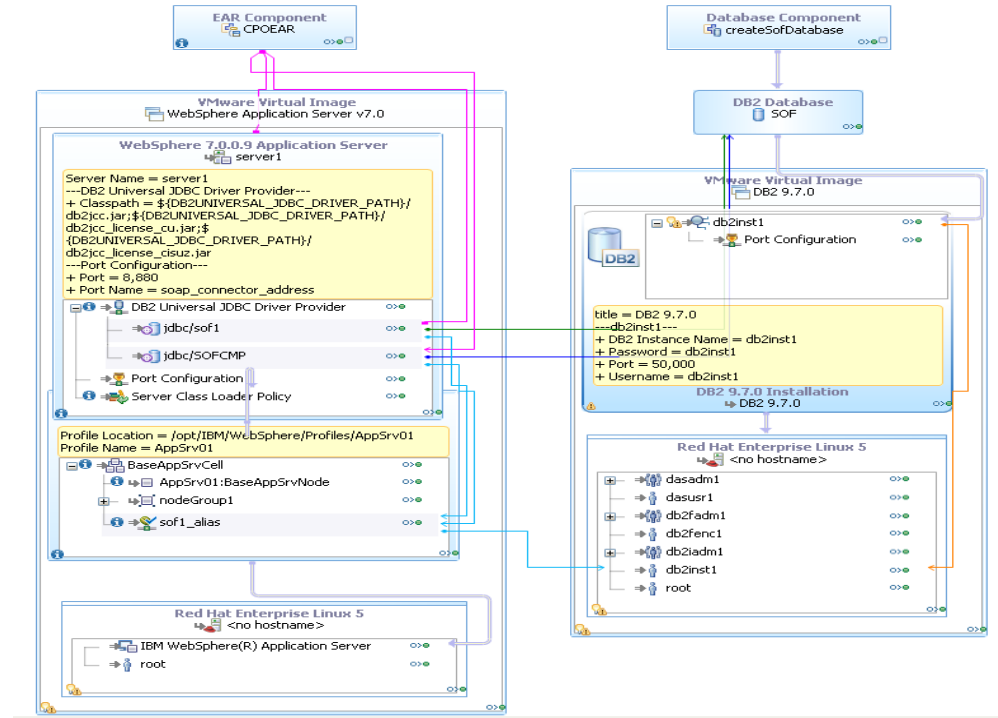
# Deployment Planning Capabilities

- **Rich UI Diagramming**
  - Multiple views over the same data
  - Layers and re-usable appearances
  - Validation feedback in diagrams
  - Flexible representations
- **Backed by a rich semantic model**
  - Simple Extensible XML format
    - Dynamic extensions as well as static supported by a simple to use SDK
  - Technology domains (over 25 domains and growing)
  - Model changes reflected automatically in all diagrams
  - Constraints and validation with Quick Fix resolutions
- **Which can be reported upon**
  - BIRT report templates



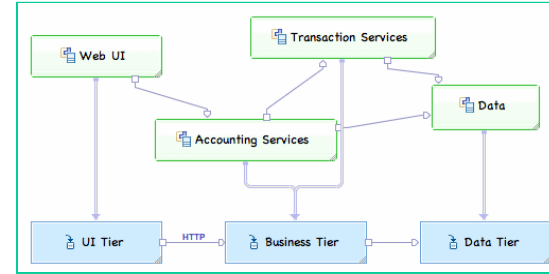
# Automation By Design Focuses on Topology

- Specify resources to satisfy application needs such as datasources and authentication
- Incorporate assumptions about middleware such as version
- Describe dependencies between separate nodes in the Topology

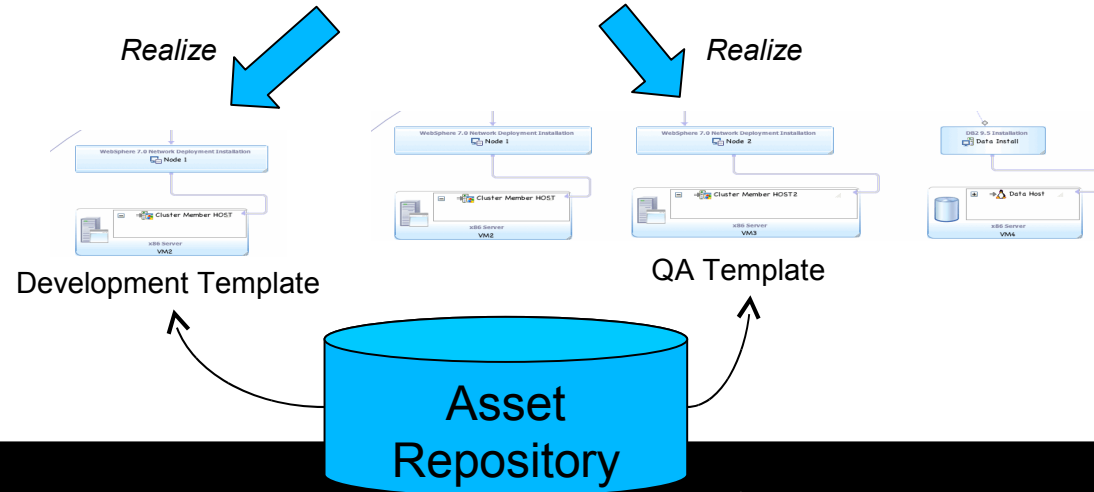


# Standardize with Deployment Templates

- Define and capture organizational **standards** with deployment templates
- **Govern** using an asset repository
- **Reuse** to guide deployment placement and implementation choices
- Ideal for capturing **standard environment patterns** and configurations



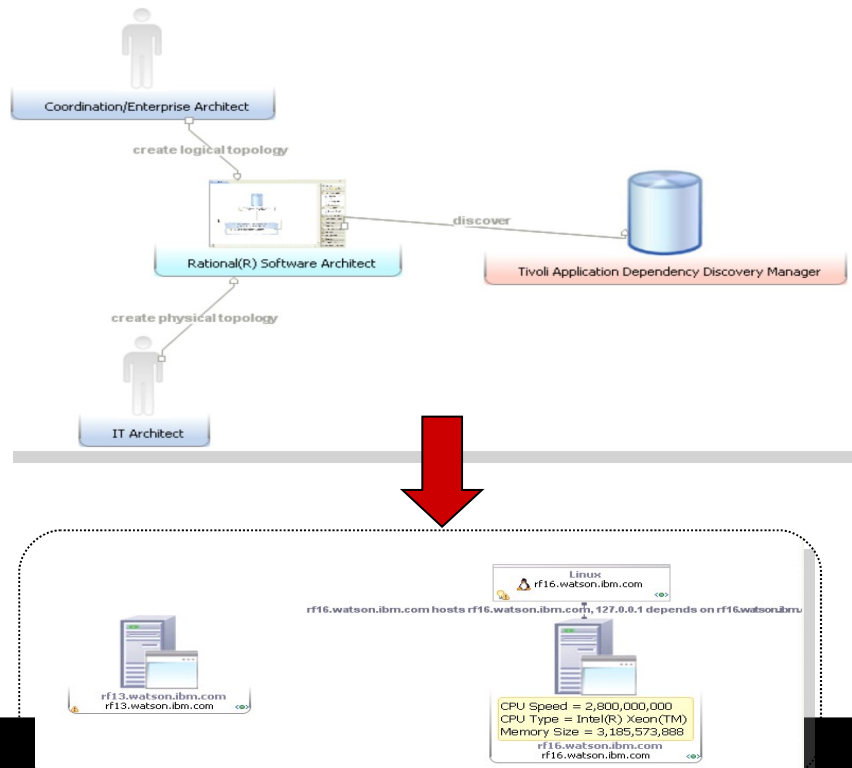
Application Topology



# Datacenter Discovery

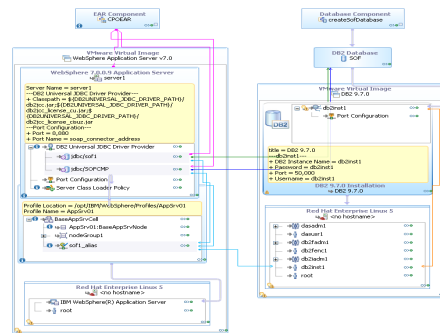
Leverage discovered operational data to expedite new designs & updates

- Reduce manual creation of topologies representing the current state of the datacenter
- Quickly understand structure of an existing datacenter
- Starting point for defining datacenter changes
- Import data from manually defined spreadsheets.



# Plan Automation from Deployment Topology

- Parameters and configuration files derive their values from the model
- Single source of truth provides pre-deployment validation and problem identification
- Allows post-generation adjustments as needed



Deployment Topology

Reference

## Analyze & Generate

Automation actor: [dropdown]

Units not covered by workflow

- nodeGroup1
- Port Configuration
- server-Class Loader Policy

Workflow tasks

- provision\_virtual\_machine (DB2 9.7.0)
- provision\_virtual\_machine (WebSphere)
- WAS\_Install (IBM WebSphere) App
- DB2\_Install (DB2 9.7.0, dbinst1, Por
- rsfv\_generate\_new\_cell (CPOEAF) serv
- create database (CPOEAF) createSoftw
- was\_common\_configure\_jbase (db2\_1\_
- was\_common\_configure\_jdbc\_provide
- was\_common\_configure\_j2c\_conn\_fa
- was\_common\_configure\_j2c\_databa
- download deployable assets (CPOEAF)
- was\_common\_deploy\_install\_app (CP
- was\_common\_deploy\_start\_app (CP

Task name: provision\_virtual\_machine

Description:

Affected units:

- DB2 9.7.0
- <no hostname>
- root

Command:

```
var workflow_name="Provision_VM_in_TSAM"
var VMWareServerID="DCIMQueryForServer[@name=ImageServer][@id]
var VMWareImageID="CPOEAFQueryForServer[@name=ImageName][@id]
```

In Parameter:

| Name         | Source    | Attribute | Value                                  |
|--------------|-----------|-----------|--|
| workflow     |           |           | Provision_VM_in_TSAM                   |
| imageName    | DB2_9.7.0 | imageid   | VMware Template - HBC_V_RHEL_S4_32-COE |
| instanceName | DB2_9.7.0 | notes     | DB2express971                          |
| imageServer  |           |           | xs0526.spc.hursley.ibm.com             |

Out Parameter:

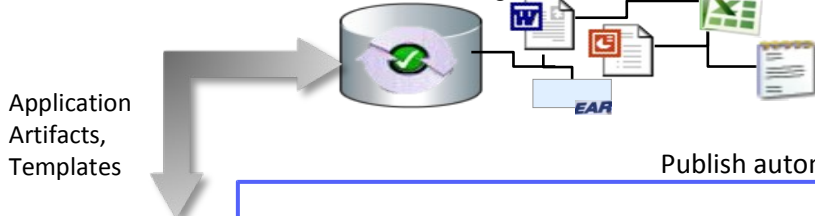
| Name     | Target  | Attribute | Value |
|----------|---------|-----------|-------|
| hostname | db2_1_1 | hostname  |       |

Automation Plan



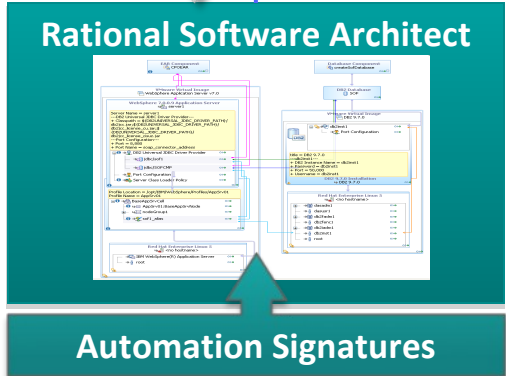
# IBM Deployment Planning and Automation Architecture

Rational Asset Manager



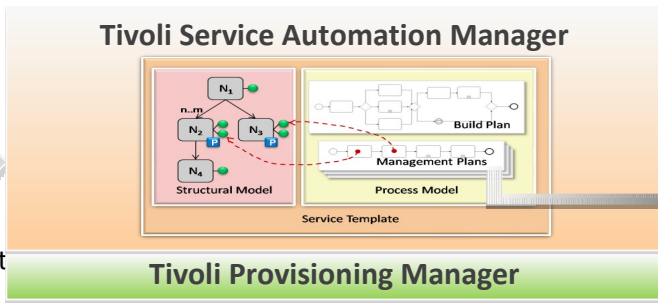
IBM Deployment Planning and Automation for Cloud package available on Integrated Service Management Library to integrate TPM workflows with RAF workflows

Rational Software Architect



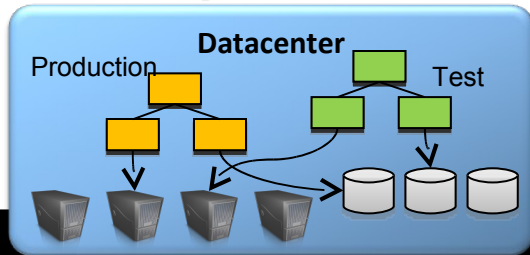
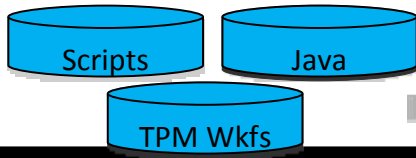
Publish Topology Template and Mgmt Plans in common format

Tivoli Service Automation Manager



Rational Automation Framework

Automation tasks made available as



Optimising the World's Infrastructure



Properties Topology Status Layers Cloud Management Cloud Details Assets Publish Report

Search returned 30 assets in 375 ms

| Name   | Version | State    | Community                | Rating |
|--|---------|----------|--------------------------|--------|
| WebSphere sMash                                      | 1.0     | Approved | Cloud Computing Core ... | ★★★★   |
| WebSphere Portal/WCM 6.1.5-3                         | 1.0     | Approved | Cloud Computing Core ... | ★★★★   |
| WebSphere Feature Pack for OSGI Apps and JPA 2.0 1.0 |         | Approved | Cloud Computing Core ... | ★★★★   |
| WebSphere Application Server and ...                 |         |          |                          |        |
| suse2_10/6/09 2:13 AM                                |         |          |                          |        |
| SUSE 10 SP2  |         |          |                          |        |
| Small System Size                                    |         |          |                          |        |

**Rational Asset Manager**

Home My Dashboard Communities Assets Administration

Search My Dashboard Submit Administration

Welcome to IBM Rational Asset Manager Version 7.5

Rational Asset Manager is a collaborative environment for creating and governing assets. You can download assets, submit and manage your assets, and review, rate, and discuss assets. Administrators configure the repository with asset types, category schemas, review processes, and user roles. Use the links on this page to get started or learn more.

**Announcements**  
There are currently no announcements.

**What's New**

- Add OpenSocial gadgets to assets**  
Eclipse MySocial gadgets get the General Details page of an asset or put Rational Asset Manager gadgets on other containers. [Read more](#)
- Share forums between communities**  
To better collaborate with other teams, you can now share a forum across multiple communities. [Read more](#)
- Generate OAuth consumer keys for other applications**  
You can now generate OAuth consumer keys and secrets so that other applications can access information on this repository. [Read more](#)
- Integrate with Lotus Connections**  
View Profiles business cards for users and add an iWidget to a Lotus Connections community. [Read more](#)
- Rational Team Concert™, Rational Quality Manager, and Rational Requirements Composer**  
Create links to resources in IBM Rational Quality Manager and IBM Rational Requirements Composer, in addition to IBM Rational Team

**Learn**

- Tours**  
Tour the Web client  
Tour the Visual Eclipse feature  
Tour the Eclipse client
- Tutorials**  
Define a category schema
- Help**  
Introduction to Rational Asset Manager  
What is an asset?  
What is a community?  
What are roles and permissions?  
Finding and downloading assets  
Submitting assets
- Web resources**  
Rational Asset Manager home page  
Software support

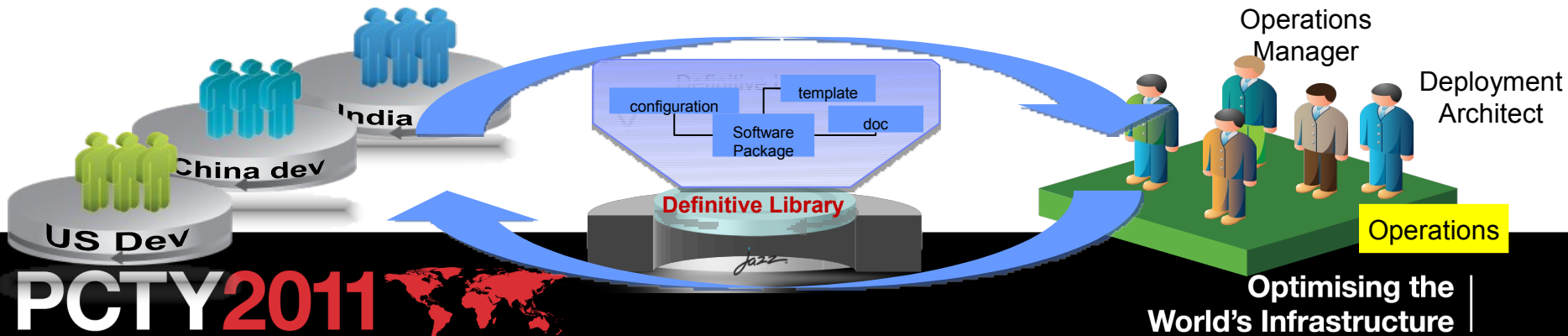
# Govern your deployments using a definitive library

*Deploy the right deliverables, with the right plan, using the right automation*

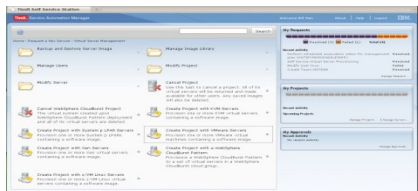
Gain control over the:

- **People** who are stakeholders in the decision making
- **Workflow** to manage sharing
- **Policies** to enforce rules
- **Access permissions** to control access
- **Traceability and auditing** for plans and automations

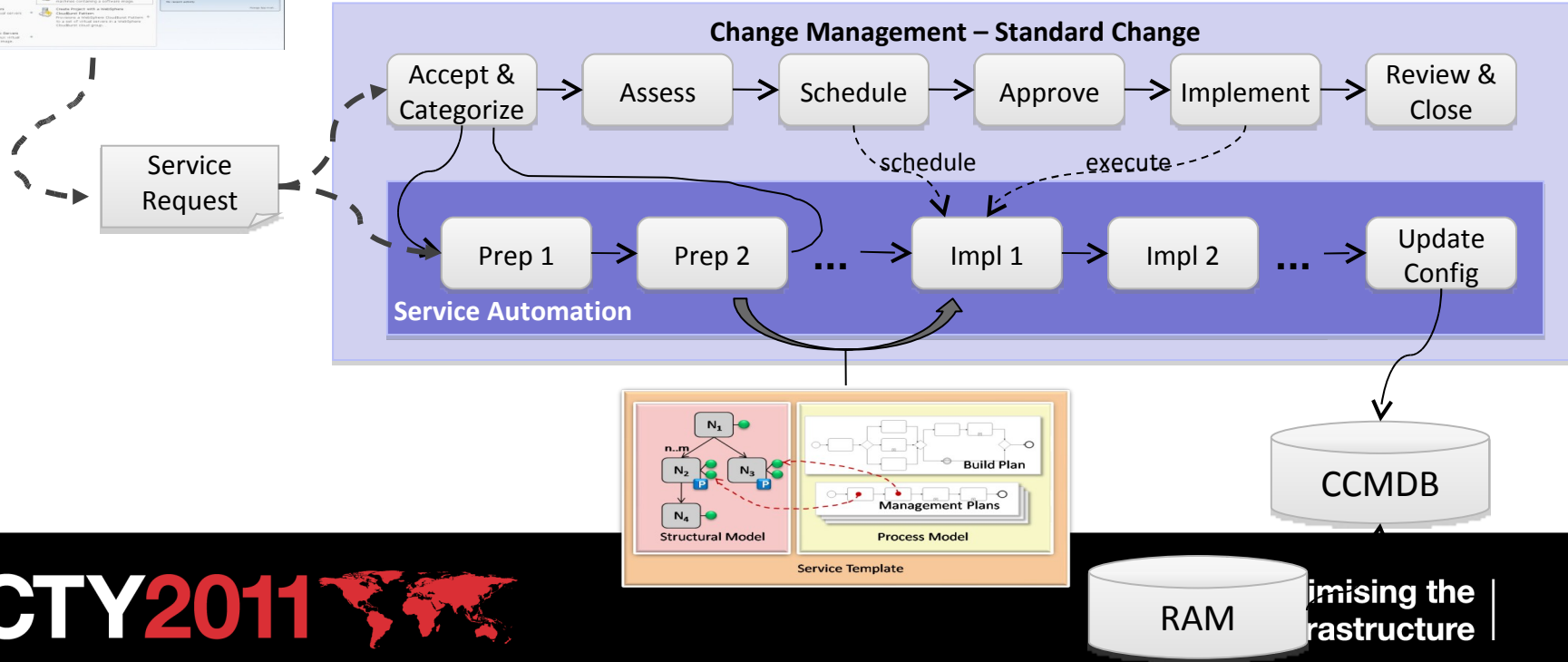
The screenshot displays a user interface for managing software assets. At the top, there are buttons for 'Submitted', 'Approve', 'Reject', 'Comment', and 'Collaborate with...'. Below these are statistics: '6 collaborators' and '2 Approvals'. A 'Download this Asset' button is also present. The main content area is divided into two columns. The left column contains navigation links: 'General Details', 'Content', 'Status', 'Ratings', 'Forums', and 'Statistics'. Below these are 'My rating' (5 stars), 'Average rating (0 ratings)', and 'Discussion topics (0)'. The right column shows a 'Submitted' list with entries for Peter Walker (approved) and Gill Mendel (approved), along with a 'Policy: Asset and artifact scanner' entry. A timeline at the bottom shows the asset's state change to 'Submitted'.



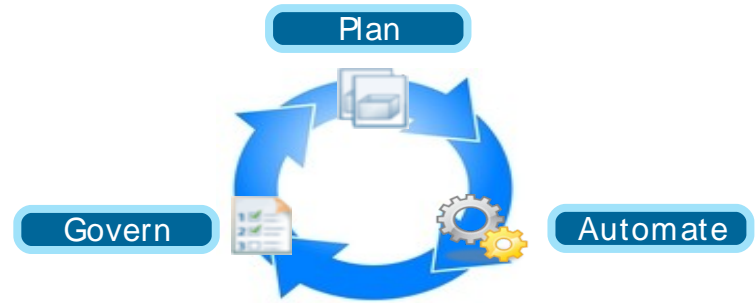
# Integrated Service Automation, Change and Configuration Management



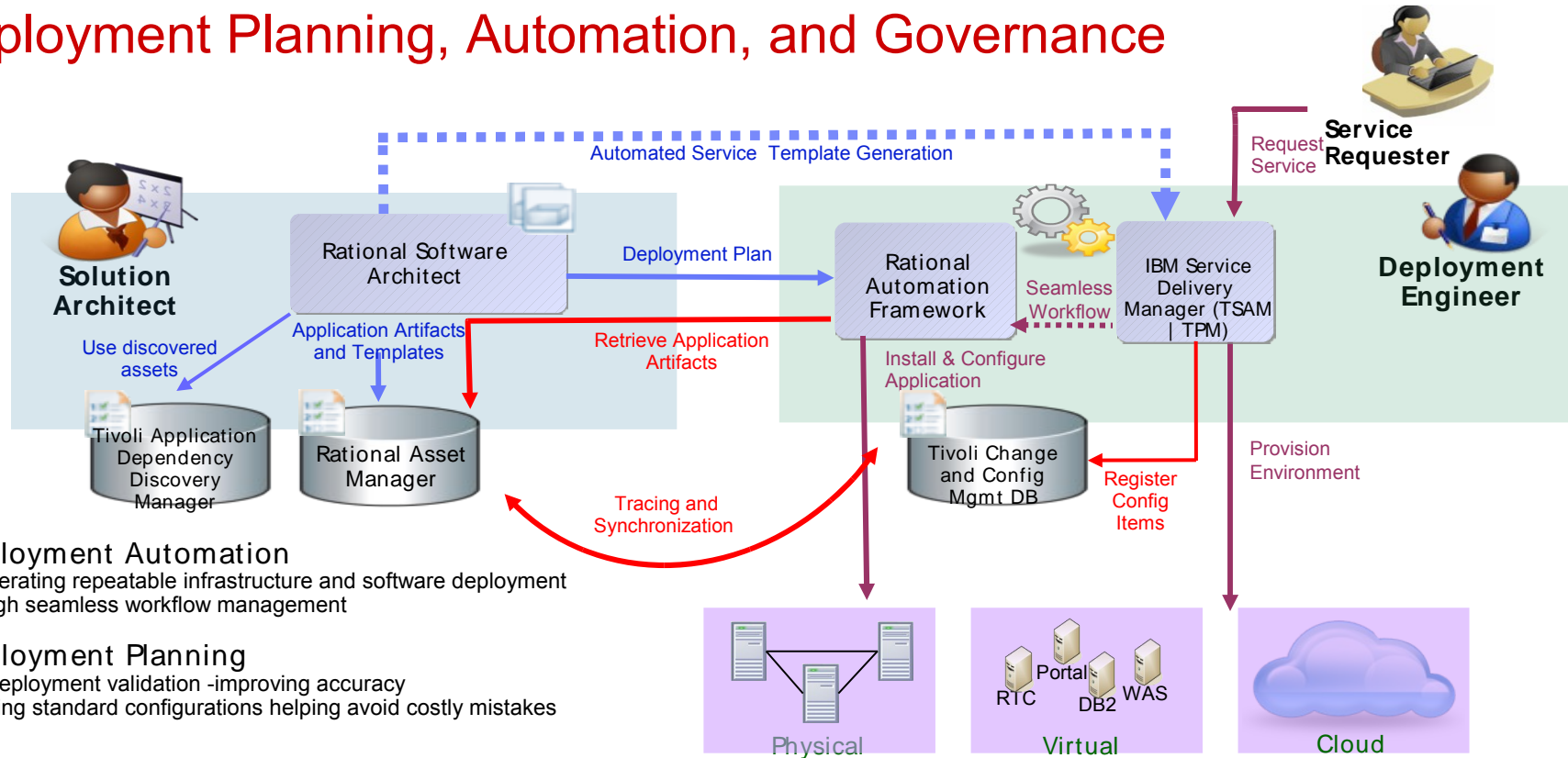
Service automation can be used stand-alone for lean and rapid service management or it can be configured to integrate with change management to have ITIL-aligned governance over the IT environment, including automated configuration updates



# Understanding the Flow - Demo



# Deployment Planning, Automation, and Governance



- **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

# Summary

- Cloud Computing provides **virtualization, standardization and automation** to **increase flexibility and reduce costs** for software delivery
- IBM Deployment Planning and Automation **speeds the delivery of high quality applications** to the cloud
- We have **services offerings** to help you **plan, manage and secure** your IT transformation onto cloud



For more information:  
<http://www.ibm.com/rational/cloud>



**QUESTIONS?**