

IT Governance for IBM® System z™ and IBM® System i™

*Roger Bowser
Business Value Sales Leader, North East Europe
Roger.bowser@uk.ibm.com*

IBM Rational Software Development Conference UK 2007



What keeps me Rational?



Abstract

- This session focuses on how organisations can use IBM Rational solutions, along with other IBM solutions, to better govern enterprise application development and comply with internal and external regulatory requirements on IBM System z and IBM System i using Source Code Library Manager – Advance Edition (SCLM – AE), ClearCase zOS extensions (CC zOSe) and ClearQuest. Additionally, the new IBM Rational Unified Process for System z will be introduced.



Agenda

- Enterprise challenges
- Solution Overview
- Rational Unified Process for Z
- Enterprise Change & Release Management

What we see ...

Geographic distribution of business - *The new norm*

- ▶ Work aligned to markets and customers
- ▶ Evolution of right-sourcing
- ▶ Leveraging distributed development

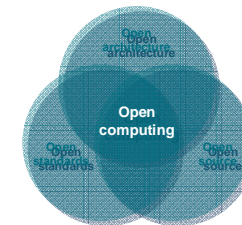


Accommodating compliance - *The new necessity*

- ▶ Management reporting, audit support
 - Sarbanes Oxley, HIPAA, 21CFR11, Basel II, EASHW
- ▶ IT, systems, project and product level accountability
 - ITIL, COBIT, COSO, ISO 900x, Six Sigma
- ▶ Development compliance level
 - Change management of assets, traceability
 - CMM/CMMII, RUP, TOGAF



Open computing - *A new route to collaboration and innovation*



Modular systems - *Greater flexibility*

- ▶ Maximize investments: *Reuse components*
- ▶ Increase flexibility: *Interoperable systems*
- ▶ Accelerate initiatives: *Scalable and agile*



What we hear ...



Increasing Business Value

How do I better manage and govern the development and integration of all my assets regardless of platform?

How do I utilize my existing development talent and skills to build new applications that leverage modern service oriented architectures ?

How do I preserve my investment in my System z assets by making them more available to other applications running on other platforms?

How can I drive down costs by making sure my developers are productive and delivering high quality applications in a predictable manner (on time and on budget)?



Governing enterprise development.....

Enable predictable, integrated, cross-platform software delivery

Extending the IBM Software Development Platform to System z

- Improve developer productivity & drive down development cost
 - ▶ Common processes & tooling regardless of deployment platform
 - ▶ Fewer tools means lower support costs
 - ▶ Better lifecycle management of assets across the enterprise
- Leverage modern application architectures & tooling
 - ▶ Off-host model driven development
 - ▶ Tools to facilitate applications discovery, understanding and refactoring
 - ▶ Converge source code libraries to facilitate parallel and iterative development and code reuse
 - ▶ Component re-use for composite applications
- Govern enterprise development
 - ▶ Better identify and manage risk
 - ▶ Monitor and manage runtime environments

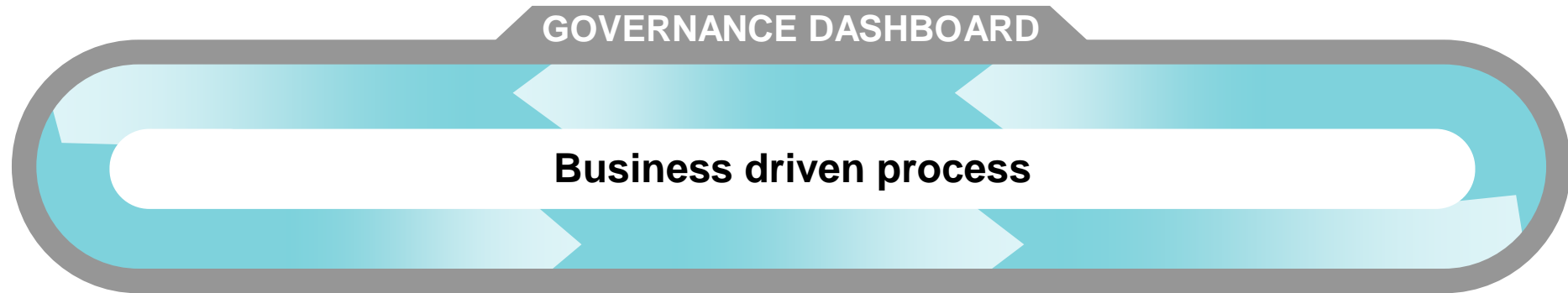


....and enables Regulatory Compliance Management

- **“Say what you do”**
 - ▶ Establish a compliant development process
 - ▶ Business controls, technical controls and workflow
 - ▶ Approvals, authorizations, quality gates, separation of duties
- **“Do what you say”**
 - ▶ Automate enforcement of your compliant process
- **“Be able to prove it”**
 - ▶ Automate the generation of audit documentation
 - ▶ Audit reports, audit trails for the software delivery organization

The 2nd most frequent SOX audit failure found by auditors is lack of proper oversight for making software application changes¹

Benefits of Business Driven Development



Manage value

- Align business and software
- Balance risk and return
- Provide clarity and accountability

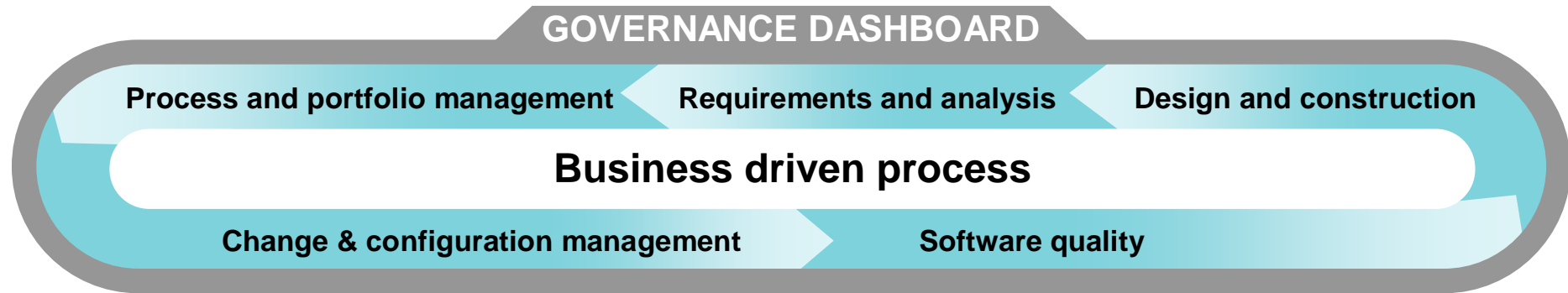
Develop flexibly

- Leverage resources anywhere
- Enable agile sourcing choices
- Adopt easily extended architectures

Control risk and change

- Continuously measure to reduce risk
- Enable lifecycle change management
- Meet regulatory compliance needs

How does IBM software make this possible?



Manage value

- Real-time analytics linking financial and software information
- Real-time resource management
- Comprehensive dashboard reporting and drilldown

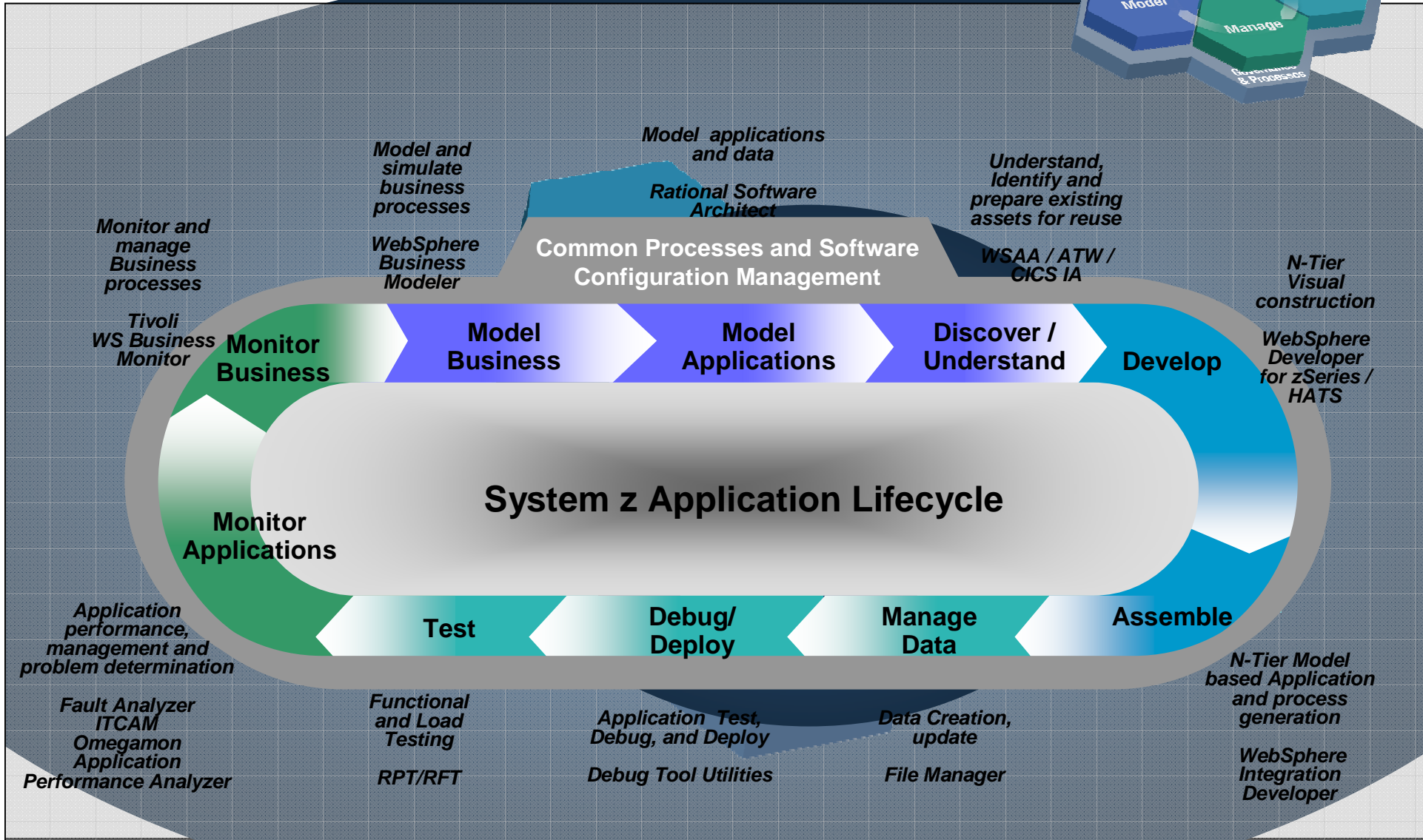
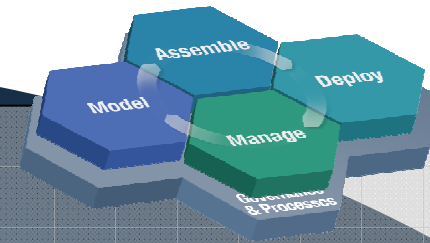
Develop flexibly

- Proven best practices
- Integrated requirements management
- SOA design and construction capabilities
- Open, role-based team environment

Control risk and change

- Lifecycle change and asset management
- Built-in audit and status information on projects and assets
- Performance testing
- Service-level monitoring

System z Application Lifecycle

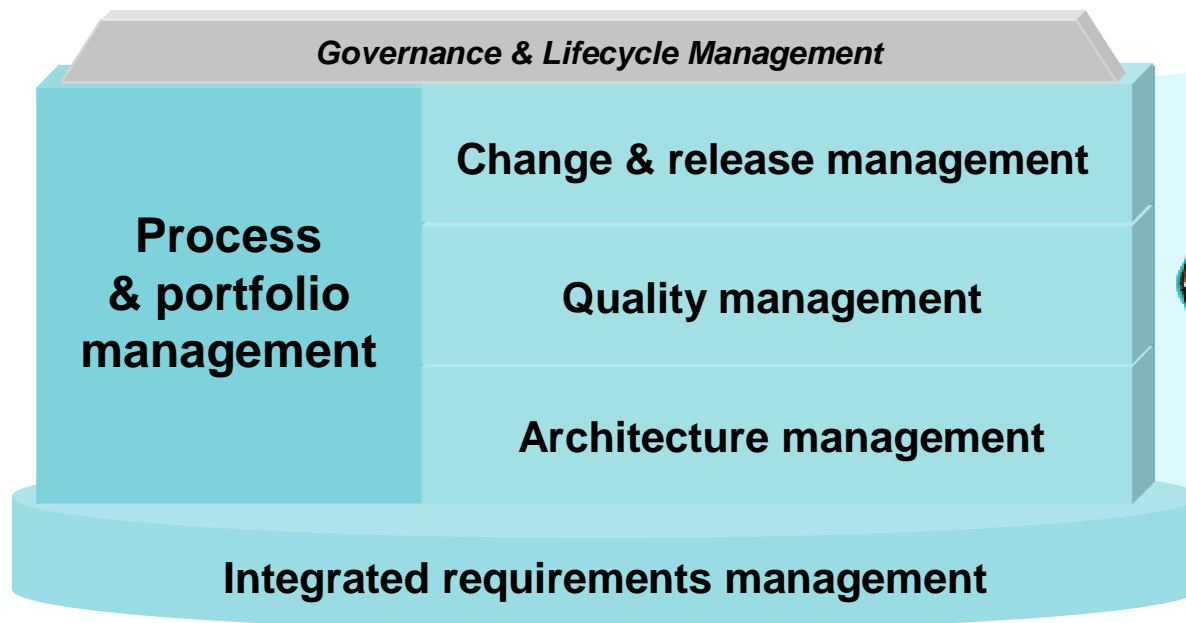


IBM Rational Solution Overview

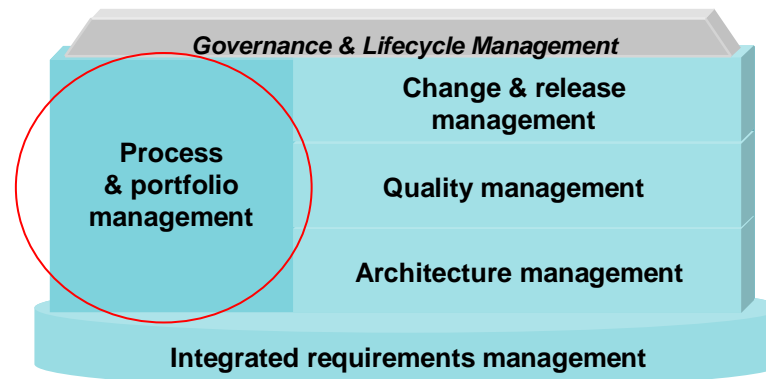
Rational. software

Process design and implementation best practices based on a market leading solutions delivery platform

In-house - Outsourced – Packaged Applications



The IBM Rational Unified Process for System z



IBM Rational Software Development Conference UK 2007



What keeps me **Rational**?



RUP for System z Key Principles



✓ Iterative Development

- Actual software system developed incrementally in each iteration.
- Facilitate feedback and mid-course corrections (requirements, scope, plan, etc.), and forces collaborations.
- Enhance predictability of delivery.

✓ Risk-driven and Architecture-centric Development

- Stabilize architecture and high-risk elements early in the project.
- Avoid late discovery of problems that could lead to project failure.

✓ Test-driven Development

- Early and frequent evaluation of running system through testing.
- Stakeholders, like users and customers, involved in evaluation.
- Enhance quality and user satisfaction.

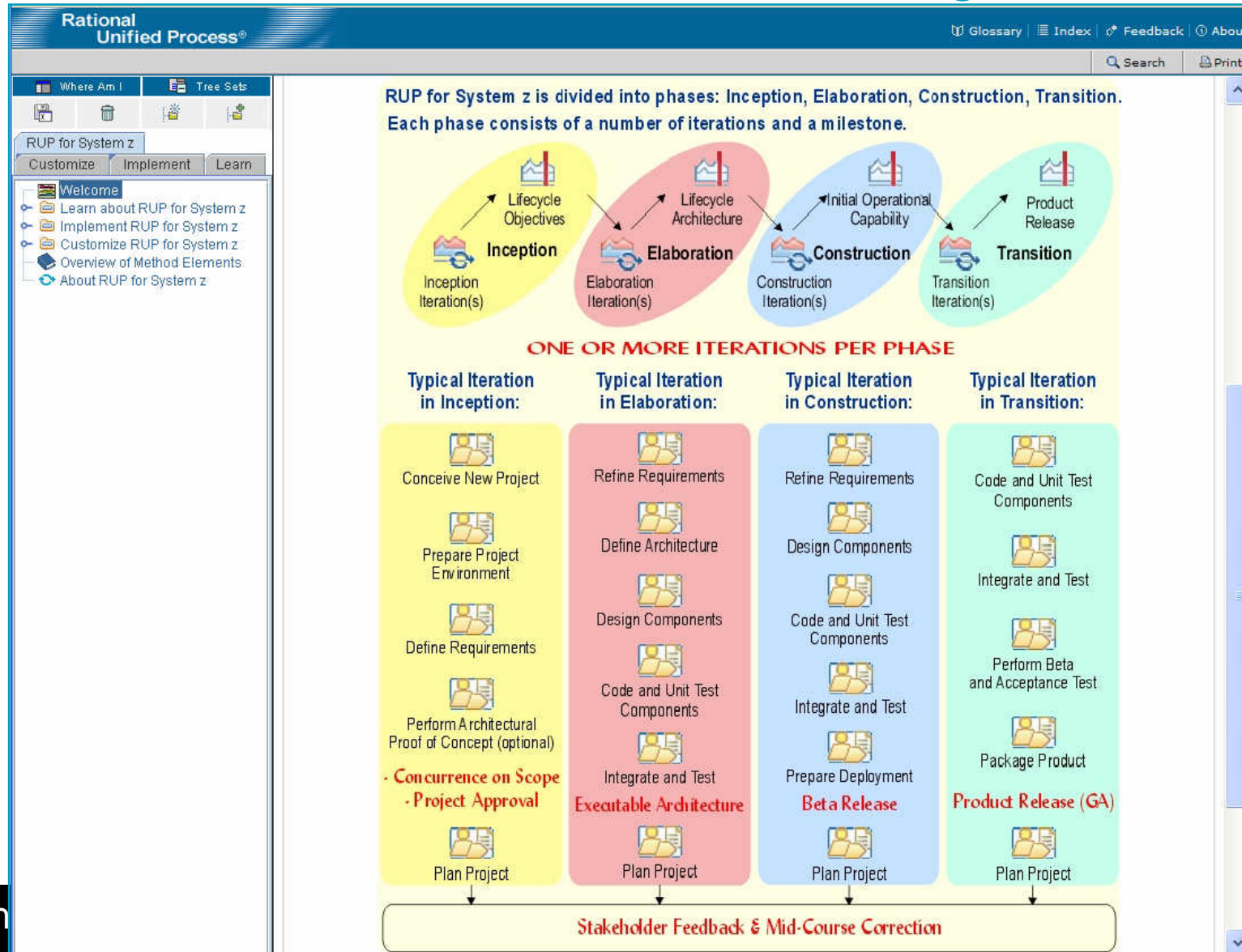
Customer Value

- Improved enterprise wide project development, maintenance and delivery governance across all platforms.
 - ▶ Schedule, through lifecycle cost, functionality and service levels
 - The lifecycle embodies modern software development principles across all enterprise platforms, while depicting practices currently in use in the z environment.
 - Provides practitioners with an end-to-end lifecycle easy to implement on z (succinct lifecycle illustrated with numerous examples).

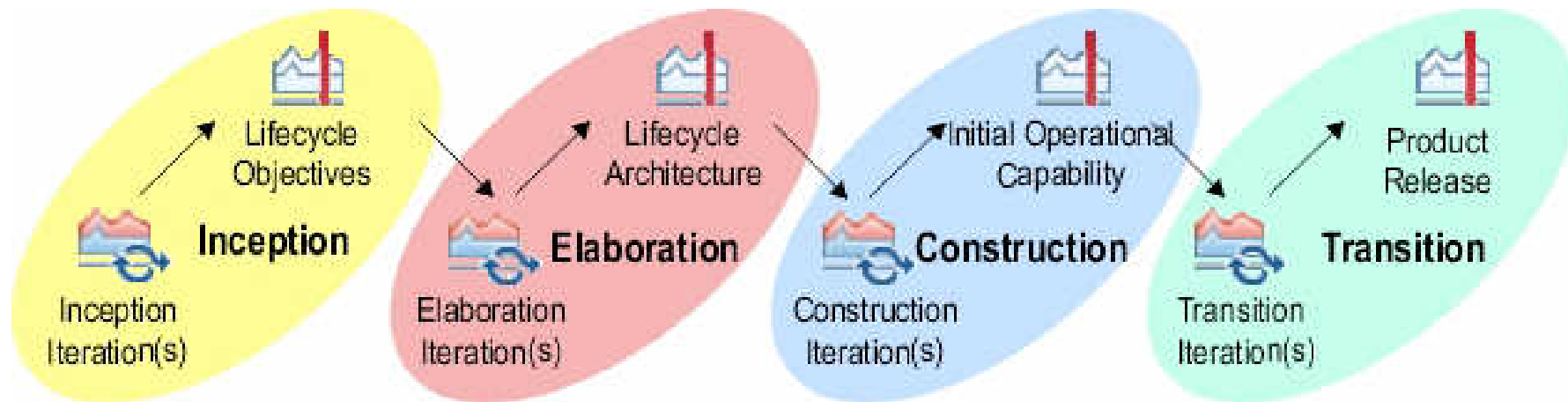
RUP for System z enables customers to leverage Rational's 25 years of experience in software engineering and modern software development practices, with IBM's long-lasting experience in developing apps in the z environment.



Rational Unified Process Overview Diagram



Content Summary - IBM Tools Leveraged per Phase



Rational Software Architect/Modeler

Rational Software Architect/Modeler

Rational Software Architect/Modeler

Rational Software Architect/Modeler

Rational RequisitePro

Rational RequisitePro

Rational RequisitePro

WebSphere Developer for z

WebSphere Developer for z

WebSphere Developer for z

Rational Manual Tester

Rational Manual Tester

Rational Functional Tester

Rational Functional Tester

Rational Clear Case

Rational Clear Case

Rational Clear Case

Rational Clear Case

Rational Portfolio Manager

Rational Portfolio Manager

Rational Portfolio Manager

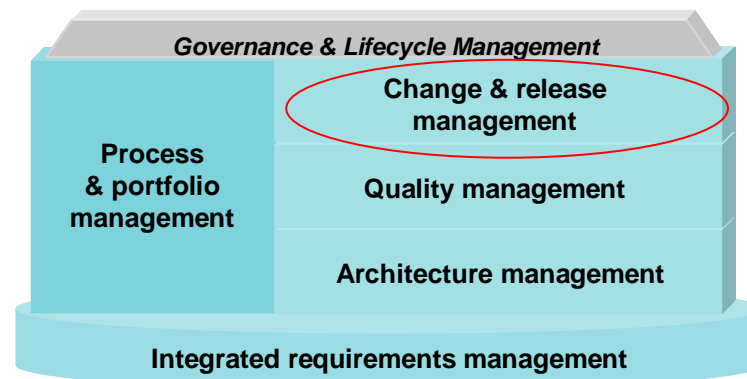
Rational Portfolio Manager

Rational Method Composer

Rational SoDA

Rational SoDA

IBM Software Delivery Platform: Enterprise Change and Configuration Management solutions



IBM Rational Software Development Conference UK 2007



What keeps me Rational?



Session: ZI5

Managing enterprise software change Improving productivity, quality and predictability

IBM Rational ClearCase

Lifecycle Management
and Control
of Software Assets

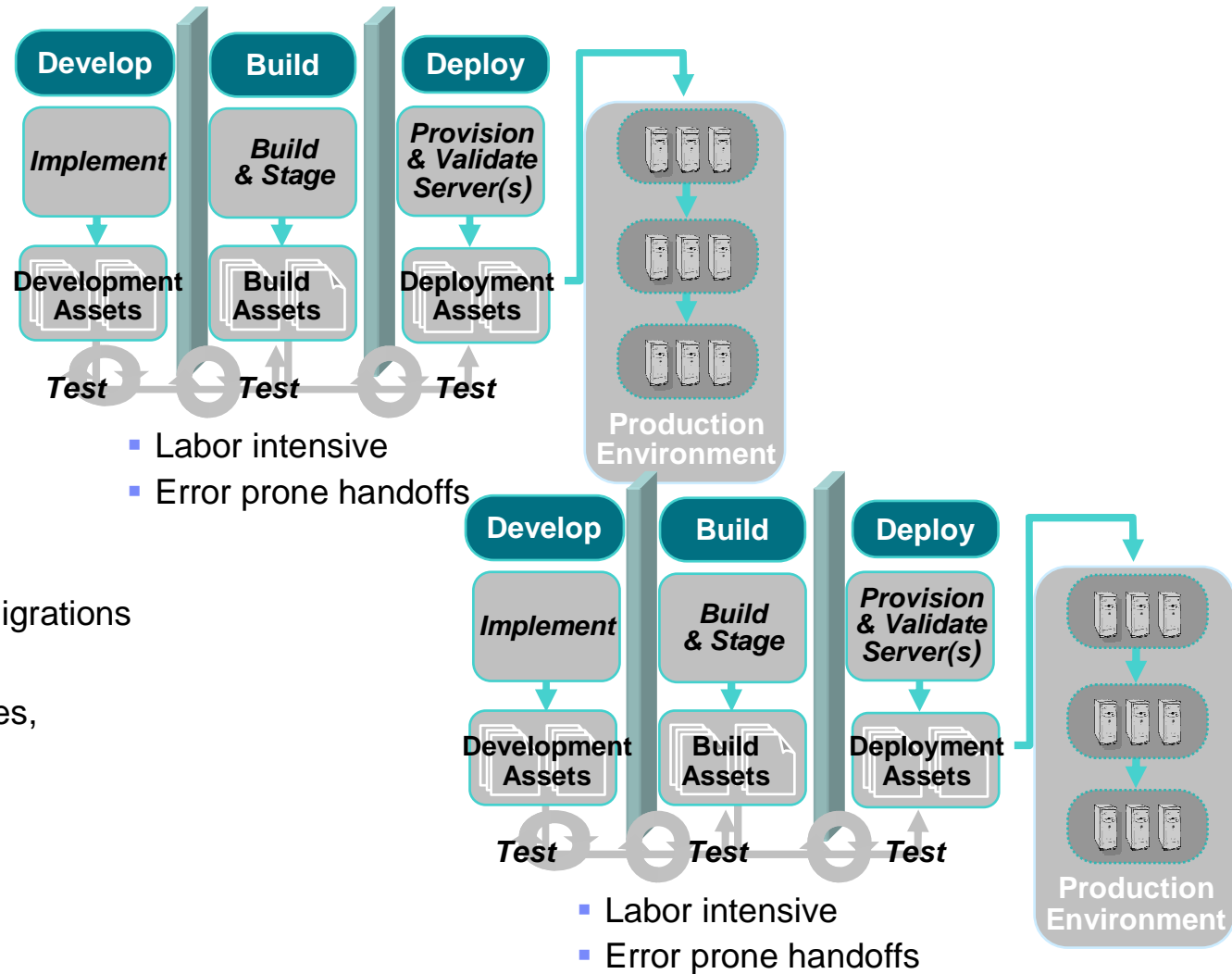
- ✓ Version Control
- ✓ Workspace Management
- ✓ Parallel Development Support
- ✓ Build Management
- ✓ Transparent Real-Time Access

IBM Rational ClearQuest

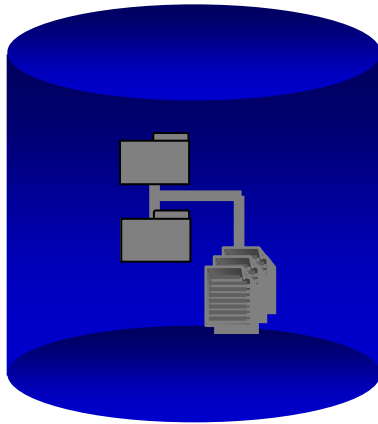
Insight, Predictability
and Control of the
Development Process

- ✓ Automated, Flexible Workflow Management
- ✓ Change and Defect Tracking
- ✓ Out-of-the-box Reports
- ✓ Easy Customization

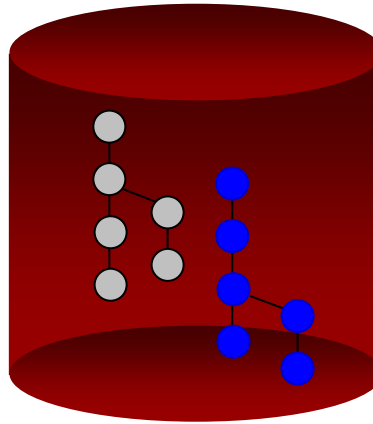
Challenge: Silos Between z/OS & Distributed Environments



In other words: Moving many components . . .



Load Modules,
JCL, Libraries



Linux/Windows
Files, Libraries

On-line Cable Subscriber System v2.0

Native widgets

EJB's, JSP's

DB2, CICS

Workstation
(Windows or Linux)

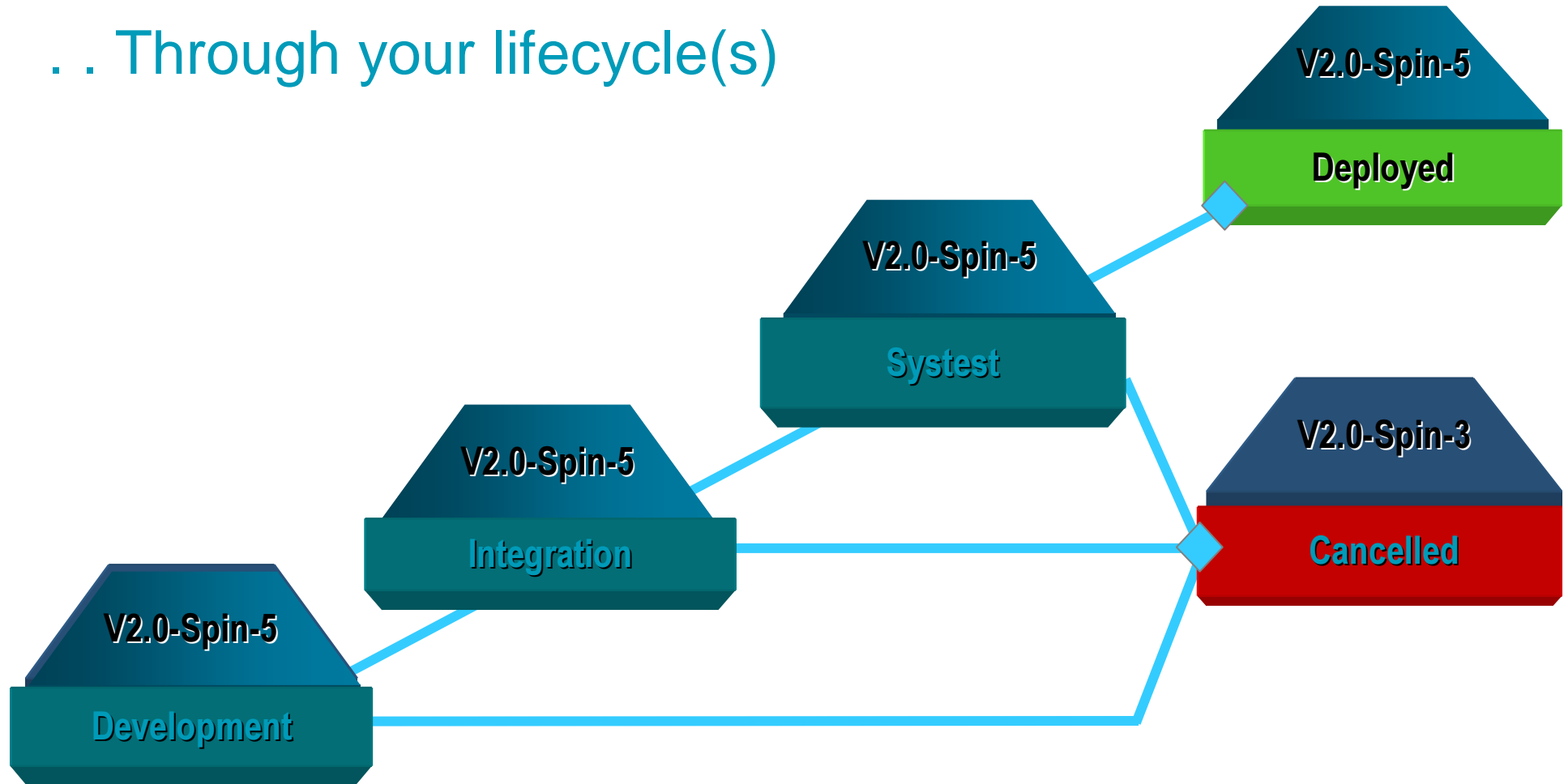
System z



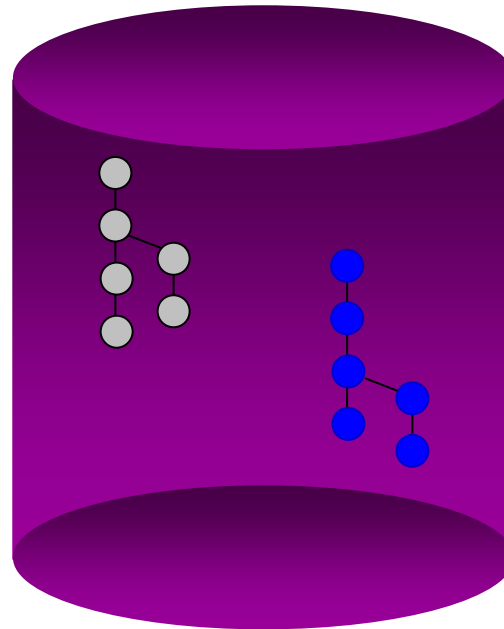
*Windows,
Unix, Linux
servers*



.. Through your lifecycle(s)

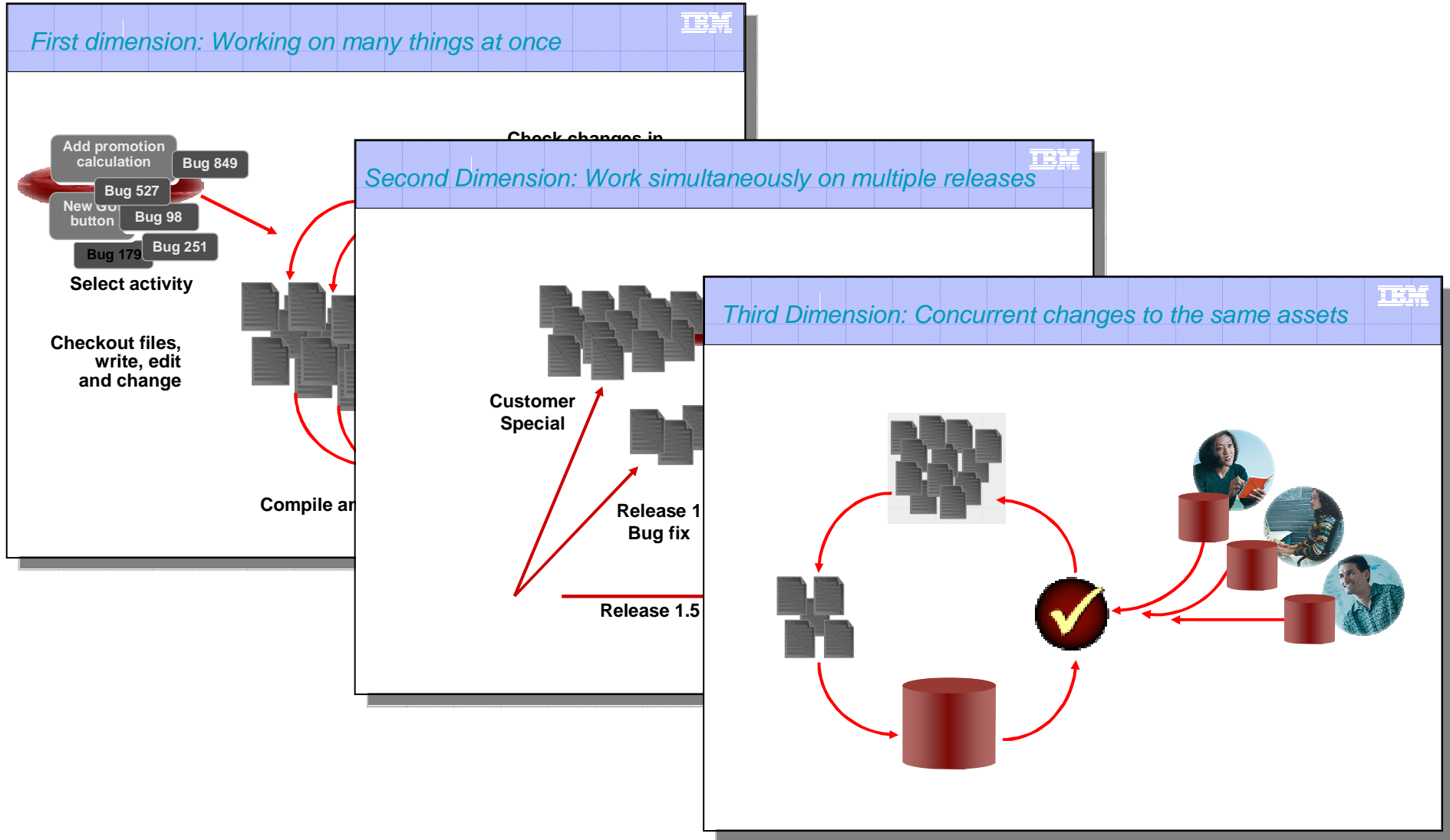


Need to be managed as one . .

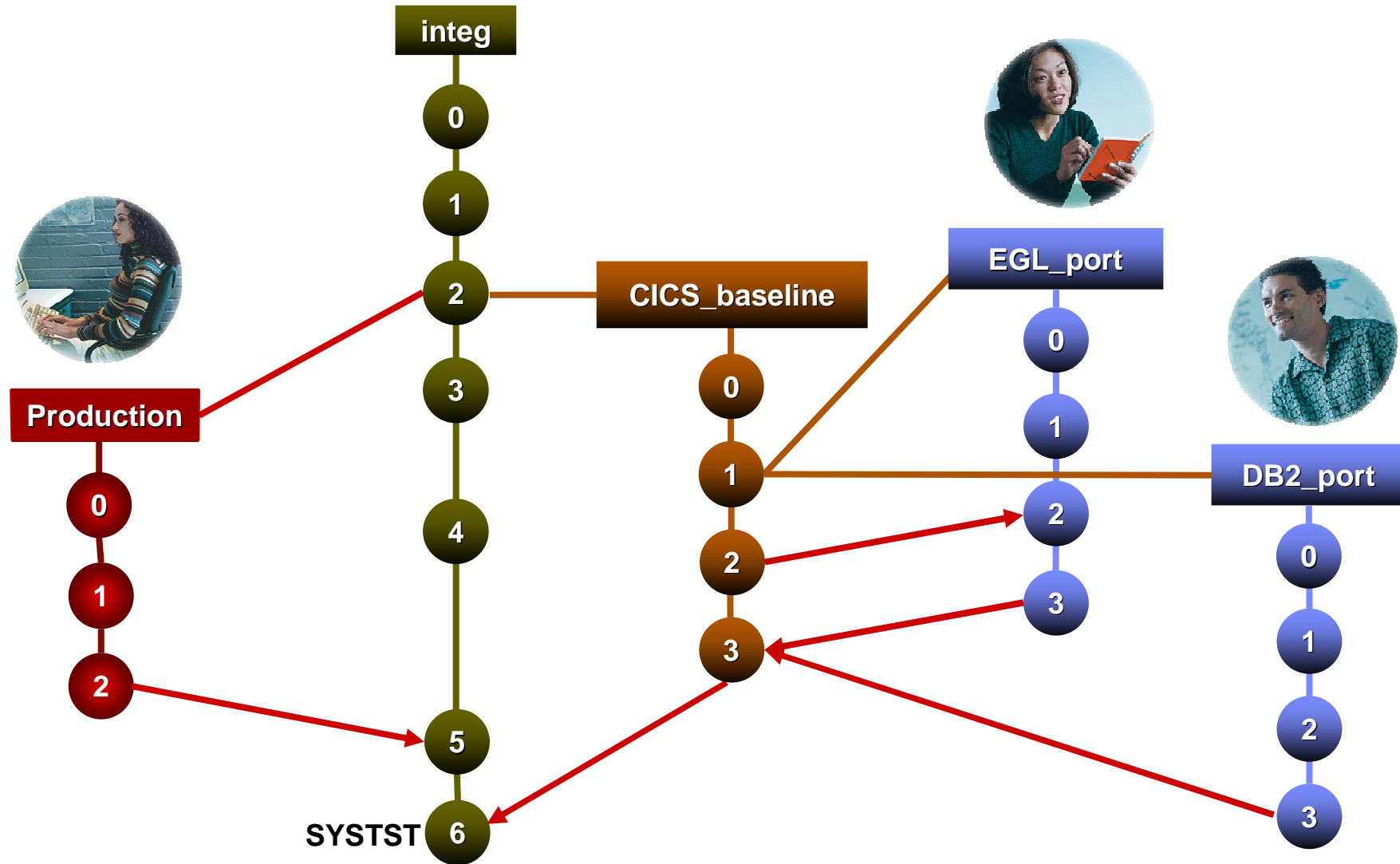


Unix/Linux/Windows/zOS
Executables

Parallel Development

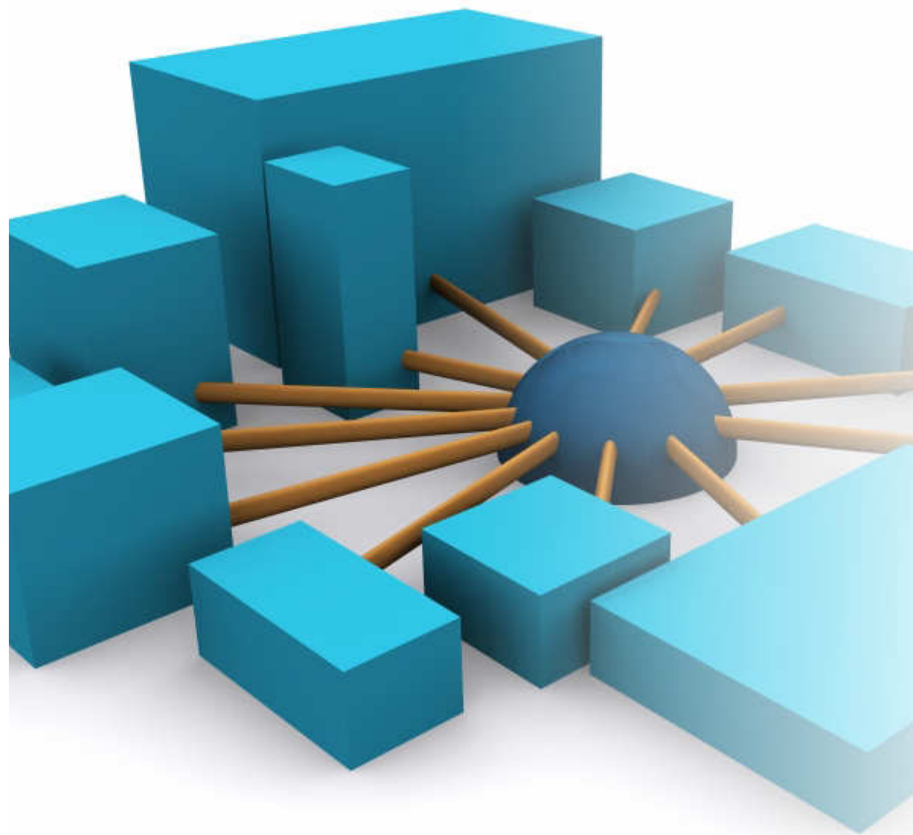


Evolve your code to meet your business needs



The hub for life-cycle management

Govern development, test and deployment process across platforms



IBM Rational ClearQuest

Test Change Defects

- Single project view
- Global project coordination
- Configurable, enforceable processes
- Extensible lifecycle ecosystem

IBM Rational ClearQuest

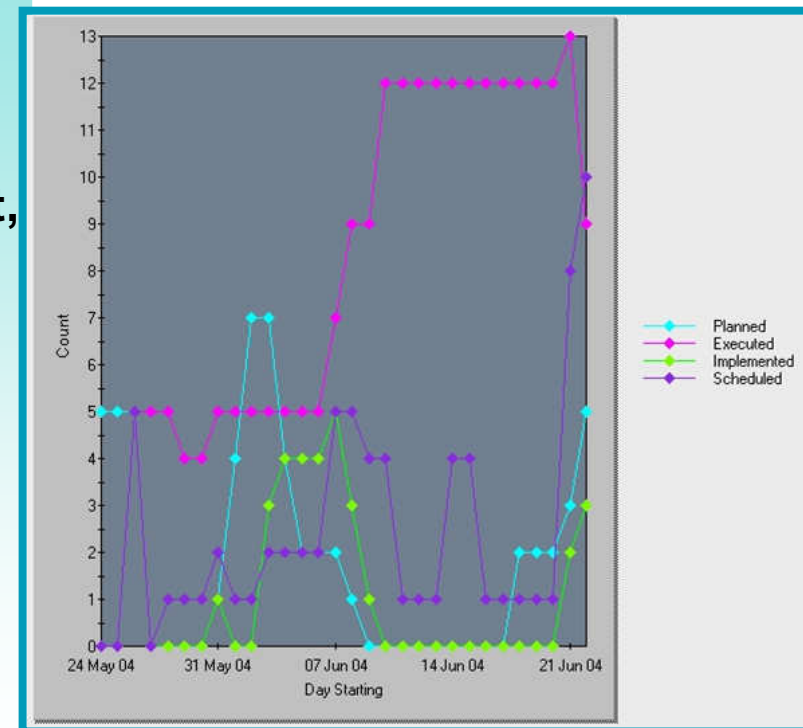
Single project view

Single solution to manage tests, defects and project change, regardless of platform

Benefits:

- **Single reporting solution for all development metrics**
- **Traceable, auditable relationships between development, test, deployment, and project artifacts**
 - ▶ Manages test planning, test results, quality metrics, and defects
 - ▶ Central repository with integrated version control
 - ▶ Comprehensive, customizable quality metrics reports
 - ▶ Centralized user management

Defect Trending



IBM Rational ClearQuest



What keeps me **Rational**?

Session: Z15

Rational ClearQuest: Automating Activity Management

The screenshot shows the Rational ClearQuest web interface in a Microsoft Internet Explorer browser window. The browser address bar shows the URL: `http://mauritius/cqweb/main?command=GenerateMainFrame`. The interface includes a navigation menu on the left with categories like 'Personal Queries' and 'Public Queries'. The main content area displays 'Results for Query "Public Queries/All Unresolved Defects"' with a table of 6 records. Below the table, there is a detailed view for a specific defect with ID 'CLSIC00000049'.

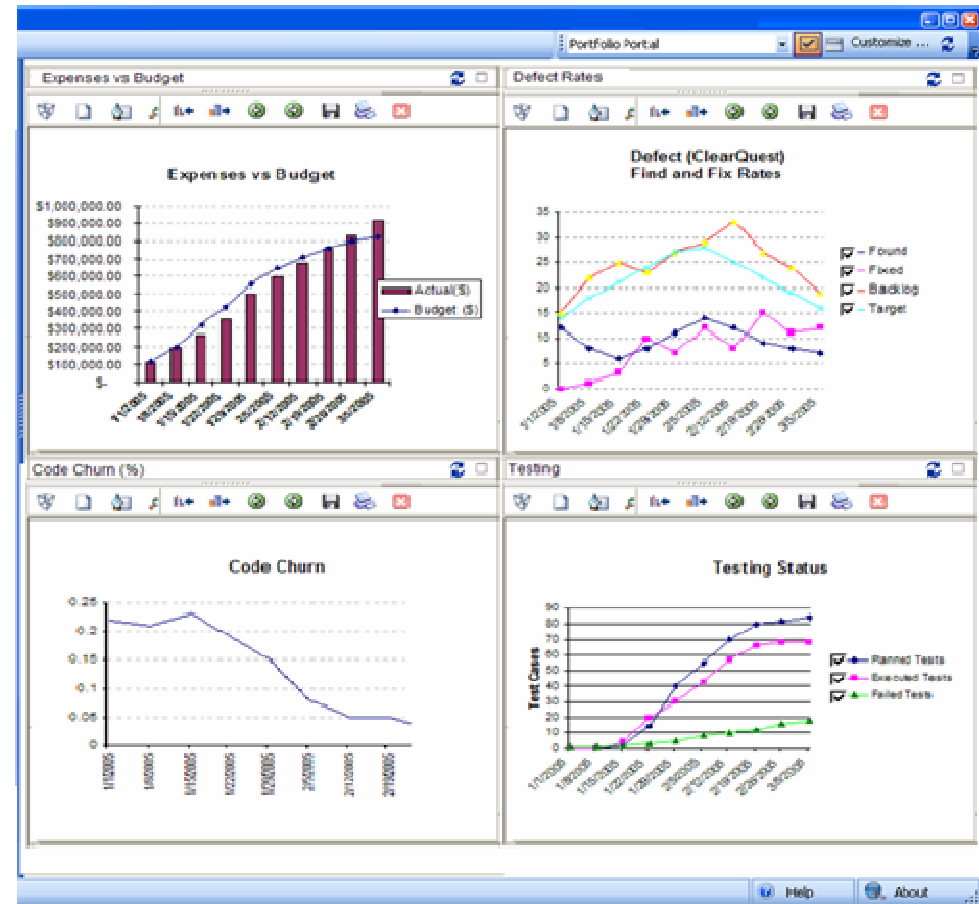
#	id	Headline	Severity	Owner	State
1	CLSIC00000049	sales tax incorrect for NH	1-Critical	morgan	Assigned
2	CLSIC00000051	inventory report is not running correctl...	1-Critical	morgan	Assigned
3	CLSIC00000071	application crash if logout before reord...	1-Critical	sandy	Assigned
4	CLSIC00000076	The System Sometimes Crashes When Order...	1-Critical	dale	Assigned
5	CLSIC00000077	The system takes forever when the custom...	1-Critical	jan	Assigned
6	CLSIC00000082	Site "hangs" when server is down	1-Critical	alex	Assigned

The detailed view for defect ID 'CLSIC00000049' shows the following information:

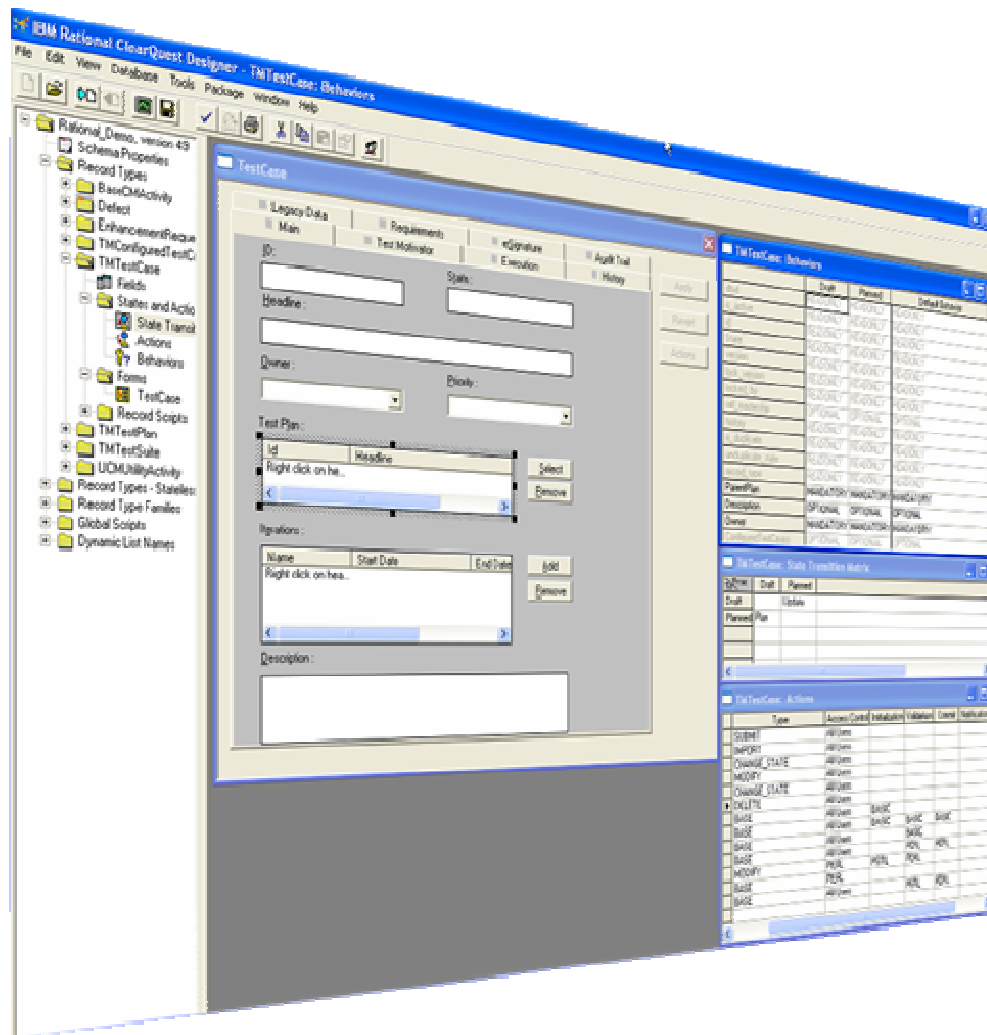
- ID:** CLSIC00000049
- State:** Assigned
- Headline:** sales tax incorrect for NH
- Suite Project:** ClassicsPOS
- Keywords:** (empty field)

Rational ClearQuest: Communicating Status

- Comprehensive project reporting
 - ▶ ClearQuest defect and test project data can be accessed from Rational Project Console and Rational Portfolio Manager
 - ▶ Provides a consolidated dashboard of all project metrics
 - ▶ Provides the information you need for all project decisions



Rational ClearQuest: Configure and Enforce Your Lifecycle

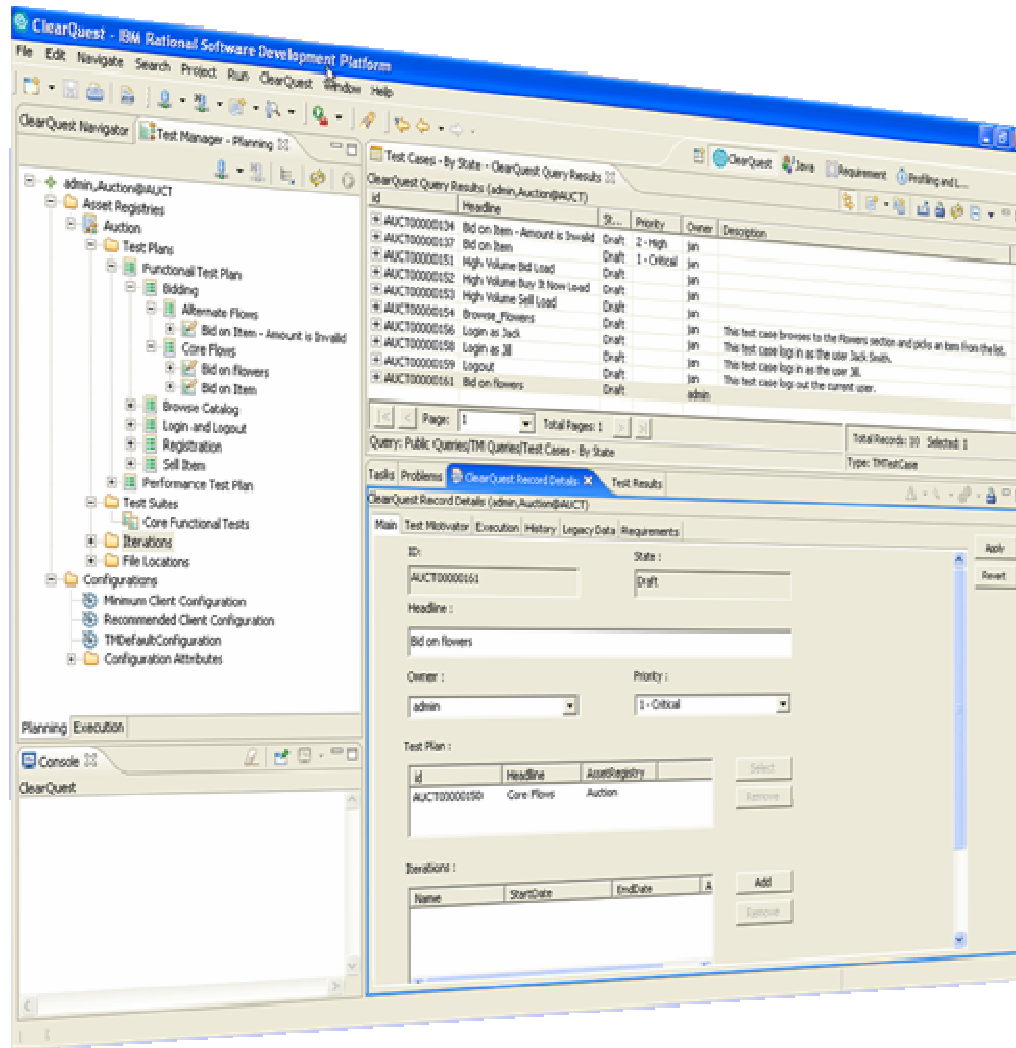


- Customize everything
 - ▶ Modify forms
 - ▶ Configure State Transition
 - ▶ Add fields and control behavior
 - ▶ Extend your system with custom coded hooks
- Extend functionality using pre-defined Packages
 - ▶ eSignatures
 - ▶ Audit Trail
 - ▶ Many, many more...



Rational ClearQuest: Automating Test Management

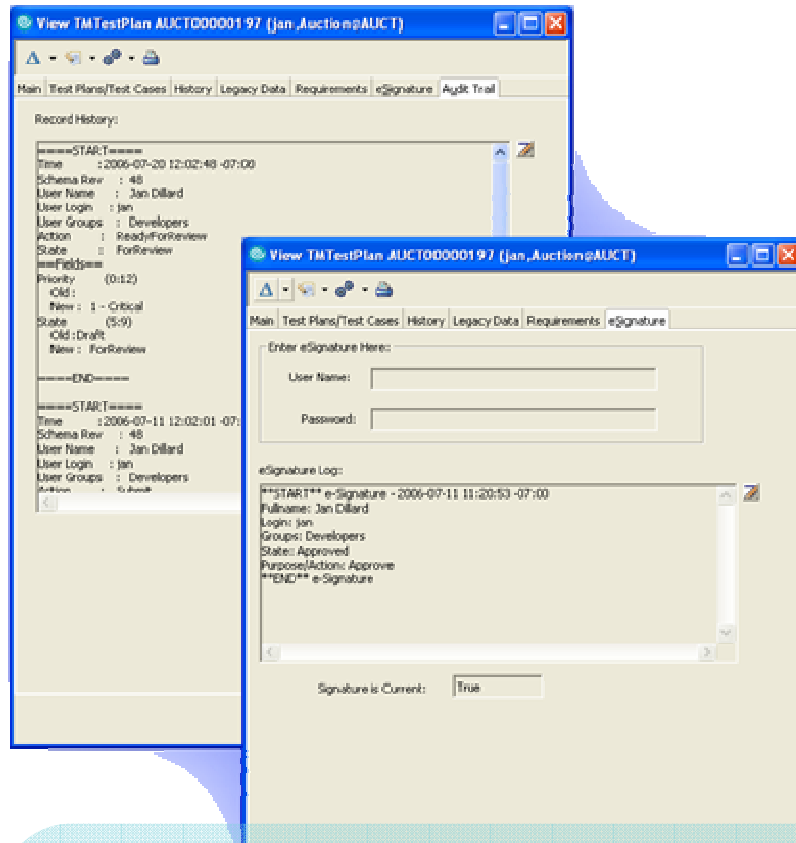
Eclipse, Windows and Web Clients for test project tracking



- **Eclipse Based Test Management**
 - ▶ Joins Functional and Performance Tester to complete transition of testing tools to eclipse platform
 - ▶ Native and web clients also available
- **Key Functional Areas**
 - ▶ **Test Planning**
 - Create test plans, test cases and configured test cases
 - ▶ **Test Execution**
 - Create suites or run individual test cases
 - ▶ **Test Reporting**
 - Extensive query and reporting facilities to measure test progress



Rational ClearQuest: Implement Compliance and Control



- Audit Trails can track changes to individual records
 - ▶ Provides immutable change log of all record change activity
- e-Signature requirement can be added to any event on any artifact
 - ▶ Will record who changed a record, when and how the record was changed
 - ▶ e-Signature provides immutable evidence of process completion

e-Signature Approval

Requirement

Test Case

Test Execution

Validate Results

Approve



What keeps me Rational?

Session: Z15

Rational ClearCase and ClearQuest

Delivering key capabilities for compliance

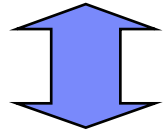
- Auditability/Traceability
 - ▶ Trace the origin and detail of all changes – who, what, when, why
 - ▶ Electronic signatures to verify changes
- Workflow Management
 - ▶ Define and enforce consistent, repeatable processes
- Access Control
 - ▶ Industry-standard authentication (LDAP, Active Directory)
 - ▶ Secure, auditable version management for all software delivery assets
- Fully Integrated Solution
 - ▶ Enterprise-class
 - ▶ Lifecycle management

IBM Rational ClearCase
IBM Rational ClearQuest

Build and Deployment Tracking



**Build
Engineer**



**Deployment
Manager**

- **Track Builds and Deployments through test environments**
 - ▶ Define and sequence test environments specific to your organization
 - ▶ Associate builds with deployments
- **Compliance Management**
 - ▶ Establish approval gates and capture electronic signatures
 - ▶ Track Release with builds & deployments, associate UCM for activities
- **Add Build Automation**
 - ▶ Integrate **BuildForge FullControl, or 3rd party build management systems**
 - ▶ Automatically create and update build records
- **Add Deployment Automation & Server Provisioning**
 - ▶ Integrate Tivoli Provisioning Manager or 3rd party provisioning systems
 - ▶ Deploy “approved” build files directly from source control

Result: Increased deployment consistency, auditability, quality

Manage and Automate the Build Process

Get high performance, reliable builds throughout the development cycle

► **Scenario:**

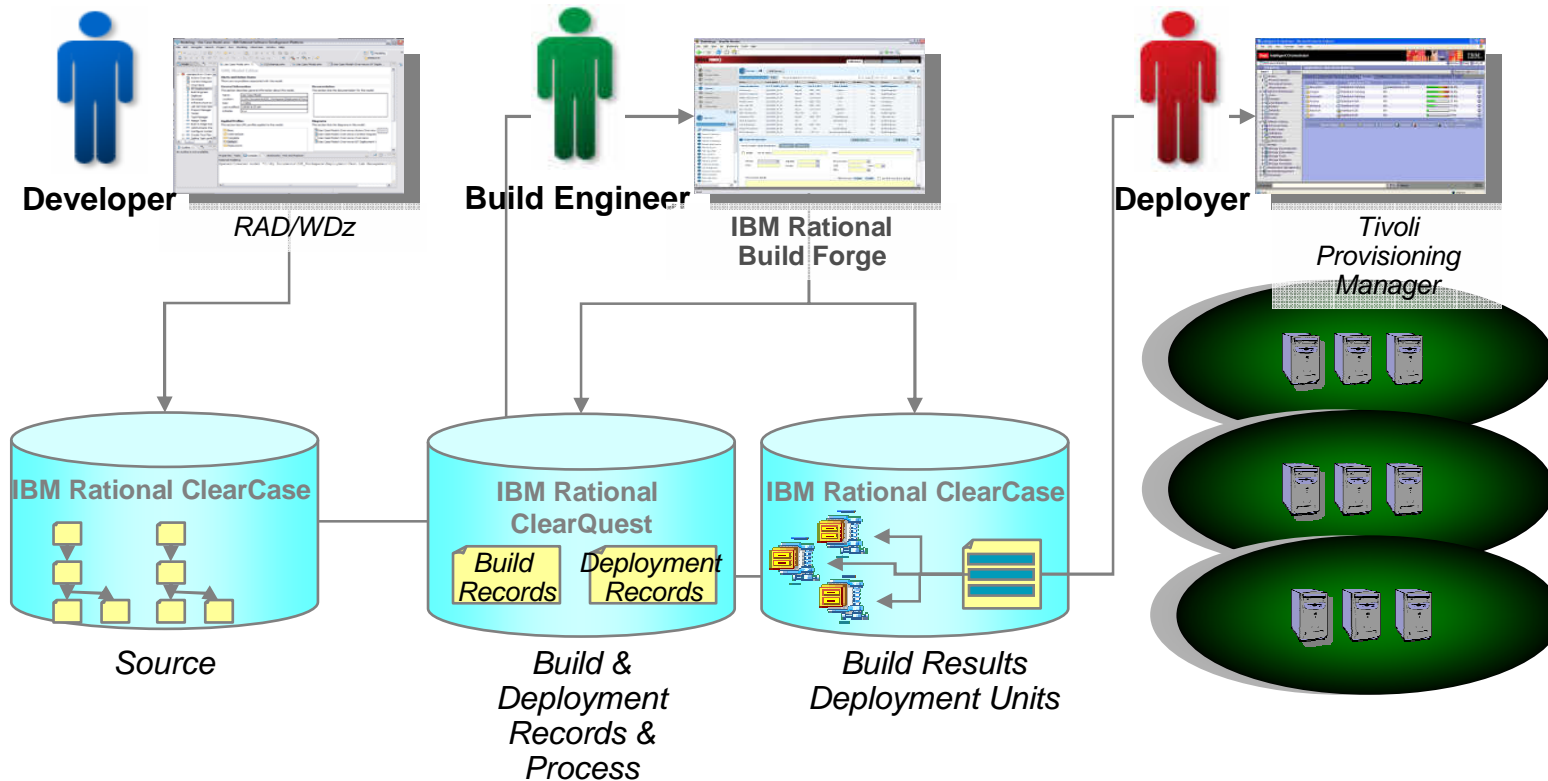
- We need to perform cross-platform builds throughout the development lifecycle.

► **What's here:**

- Rational Build Forge - perform coordinated builds across multiple platforms to streamline software delivery throughout the development lifecycle

► **What's coming:**

- Rational Build Forge – z/OS build agent

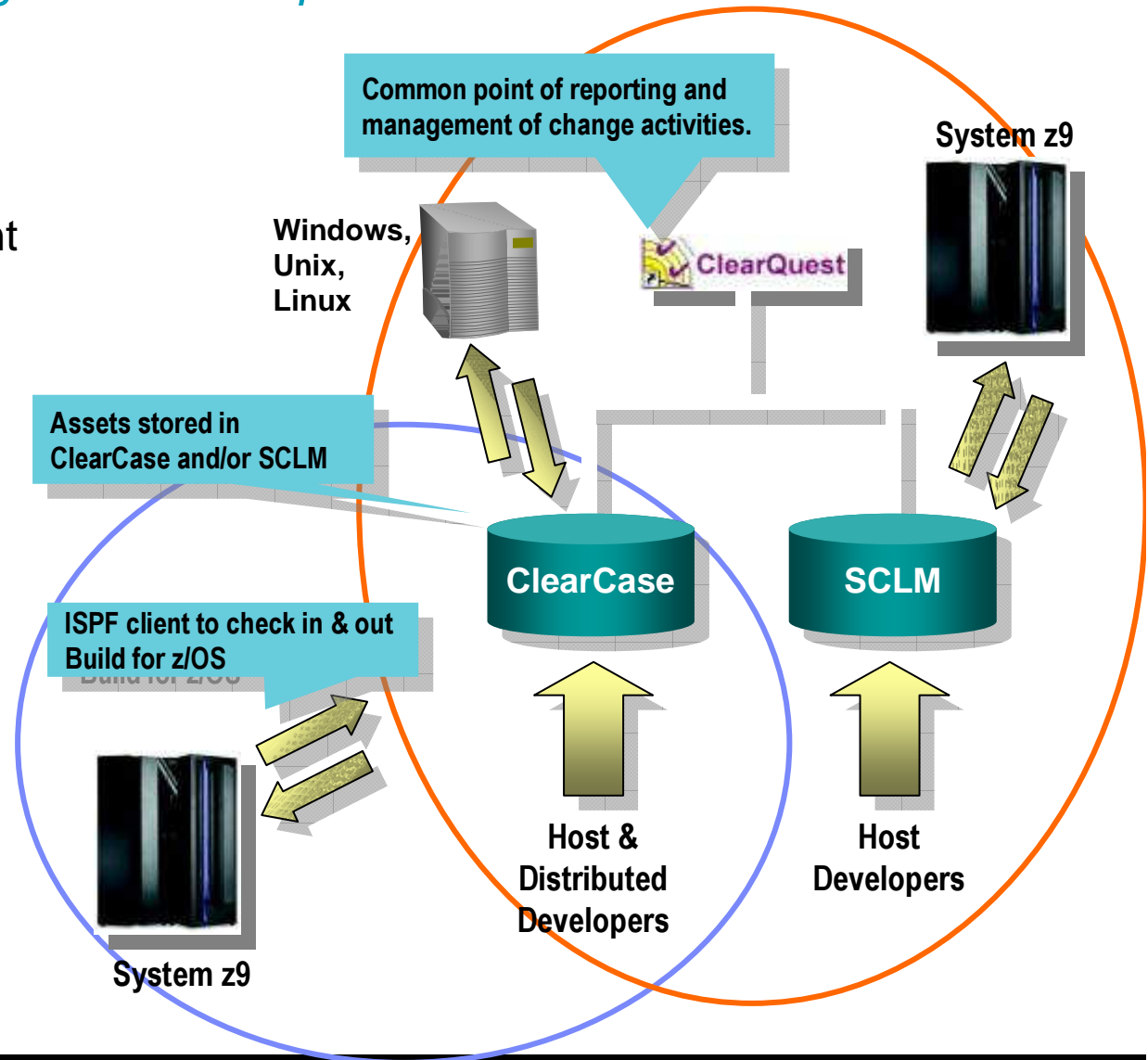


Manage Source Code across the Enterprise

Provide source code management for all platforms

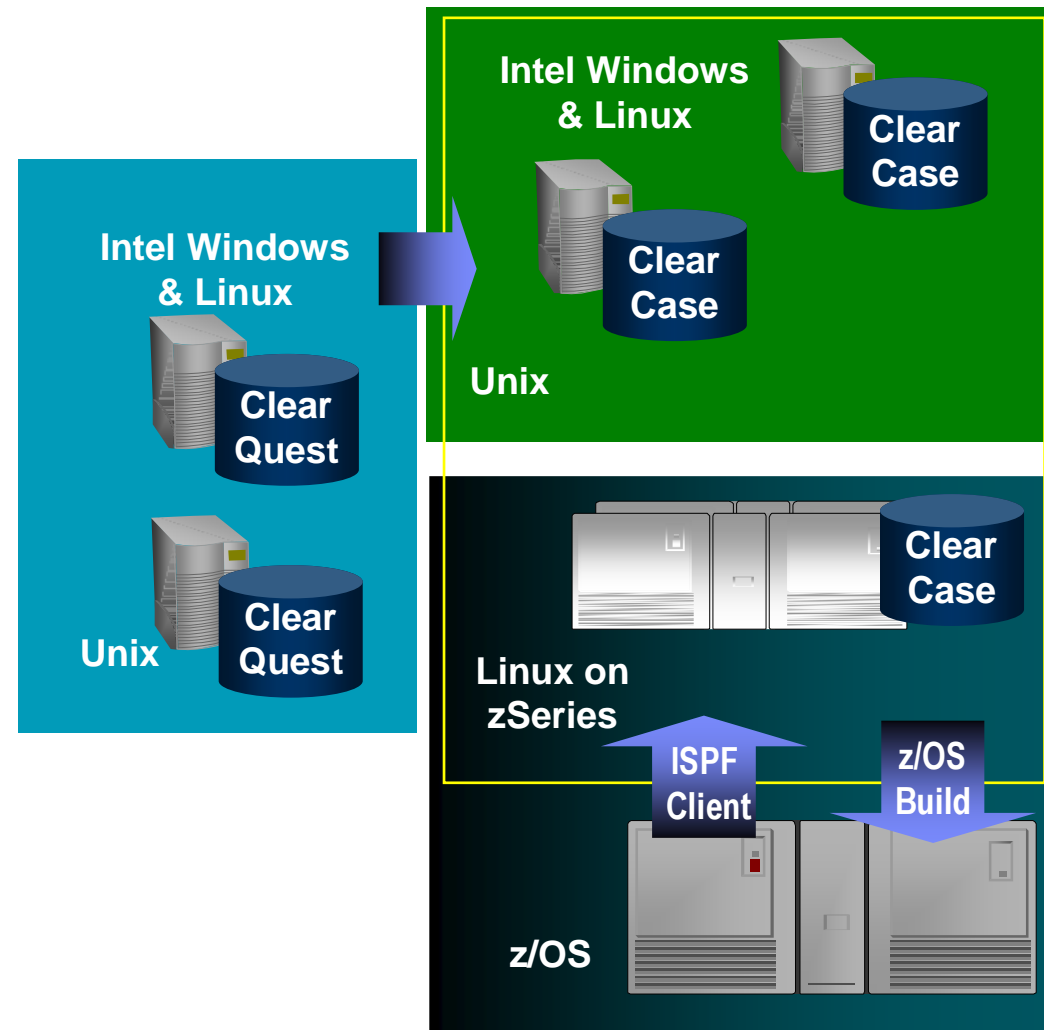
► **Scenario:**

- We need a consistent source code management solution for all of our business applications, regardless of platform



ClearCase/ClearQuest for the Enterprise

- Extends ClearCase to manage both distributed and z/OS assets
- Provides single point of control, single artifact repository, single set of user interfaces
- Provides consistent process paradigm across platforms
- Extends the power of the Software Development Platform and ClearCase/ClearCase UCM to z/OS development



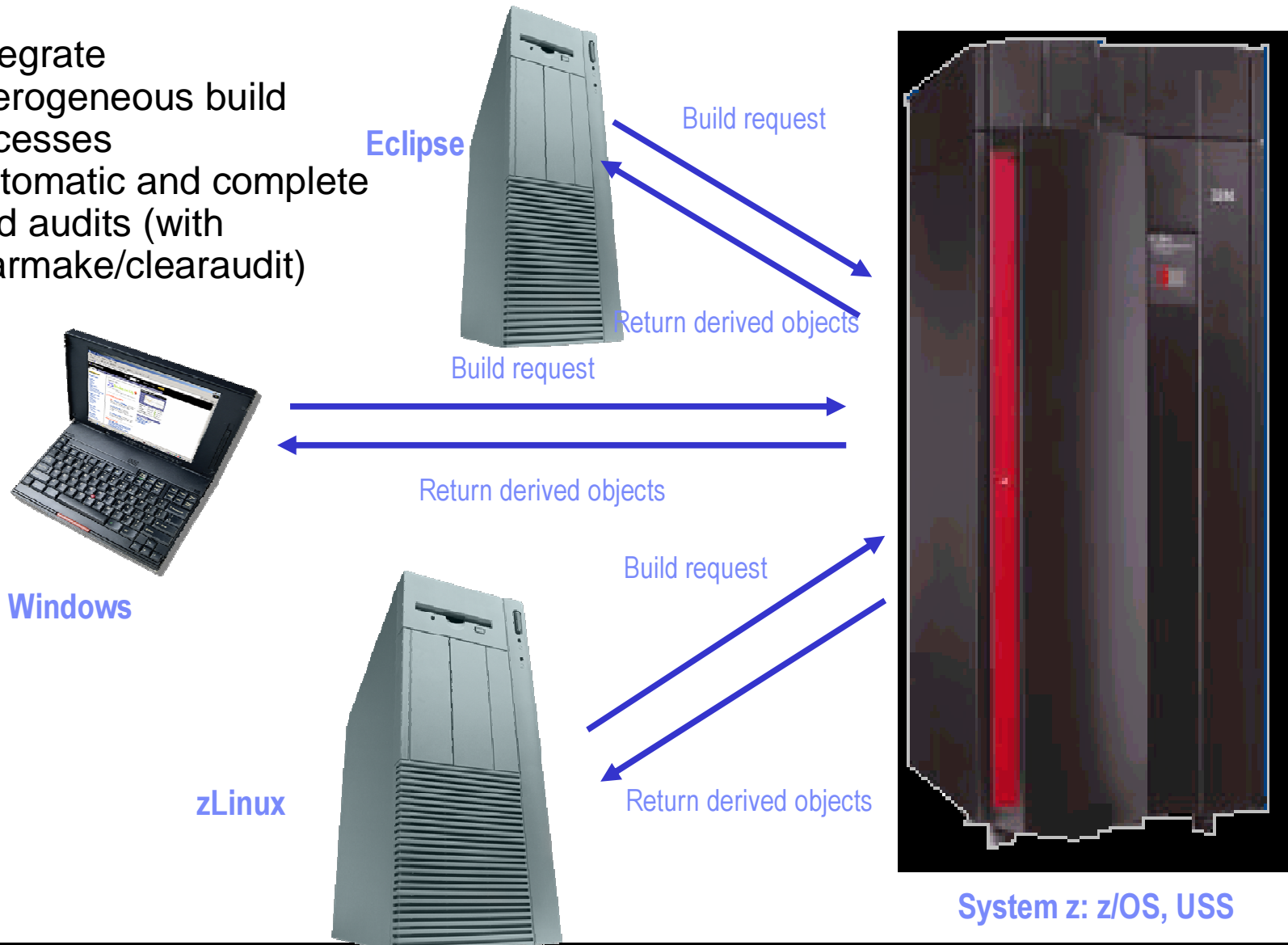
ClearCase for the Enterprise

- Extends power of ClearCase and UCM to z/OS
- Develop and manage mainframe assets from desktop, deploy to production
- Share artifacts between distributed and mainframe systems
- Benefits
 - ▶ Standardized lifecycle **across the organization**
 - ▶ Flattened learning curve for ISPF users
 - ▶ **Synchronized** release of z/OS and distributed packages
 - ▶ **Synchronized** z/OS and distributed teams
 - ▶ Fewer manual steps
 - ▶ Less exposure to errors/malfunctions
 - ▶ Increased productivity/reduced effort **across the organization**



ClearCase z/OS Remote Build

- Integrate heterogeneous build processes
- Automatic and complete build audits (with clearmake/clearaudit)

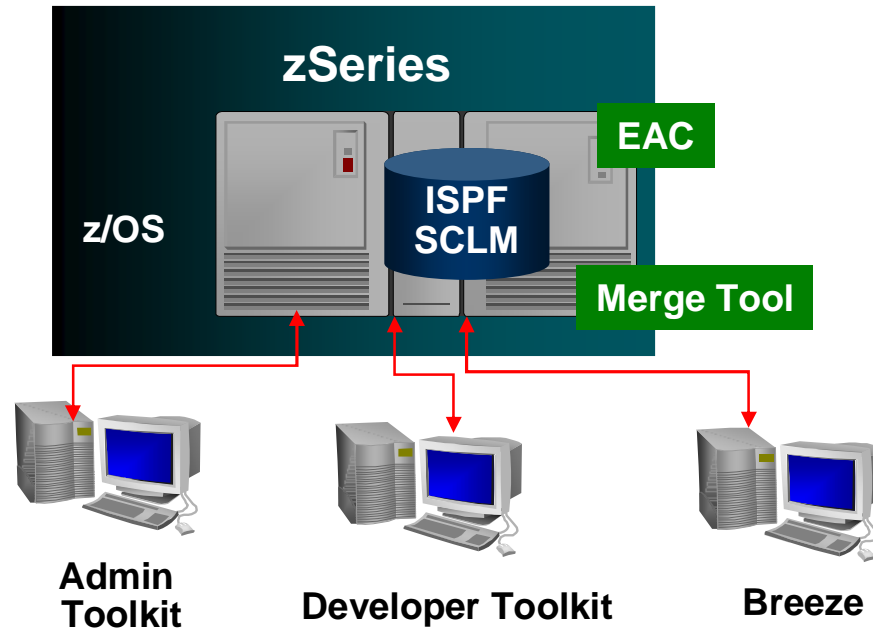


SCLM Advanced Edition for z/OS

- z/OS based SCLM with IBM SCLM Advanced Edition for z/Os extensions for enhanced security, merge, web based approvals, simplified administration, and eclipse based development
- Advantages:
 - ▶ Mature z/OS based solution
 - ▶ Proven migrations from other z/OS solutions such as ChangeMan, Endeavor, Panvalet, and Librarian
 - ▶ Lower license fees than ISV solutions or other IBM solutions

SCLM Advanced Edition

- **Breeze, Administrator Toolkit, EAC, Merge Tool, Developer Toolkit** add capabilities to bring near parity to Endeavor & ChangeMan



Federated Artifact Management



Native GUIs
Web Client
WSxD

Single Point of Management - ClearQuest

- Manage lifecycle of n-tier applications
- Automate approval workflow
- Initiate system build across platforms

Develop

System Test

Accept Test

Ready Deploy

Intel Windows & Linux

Clear Case

Unix

Clear Case

Linux on zSeries

Clear Case

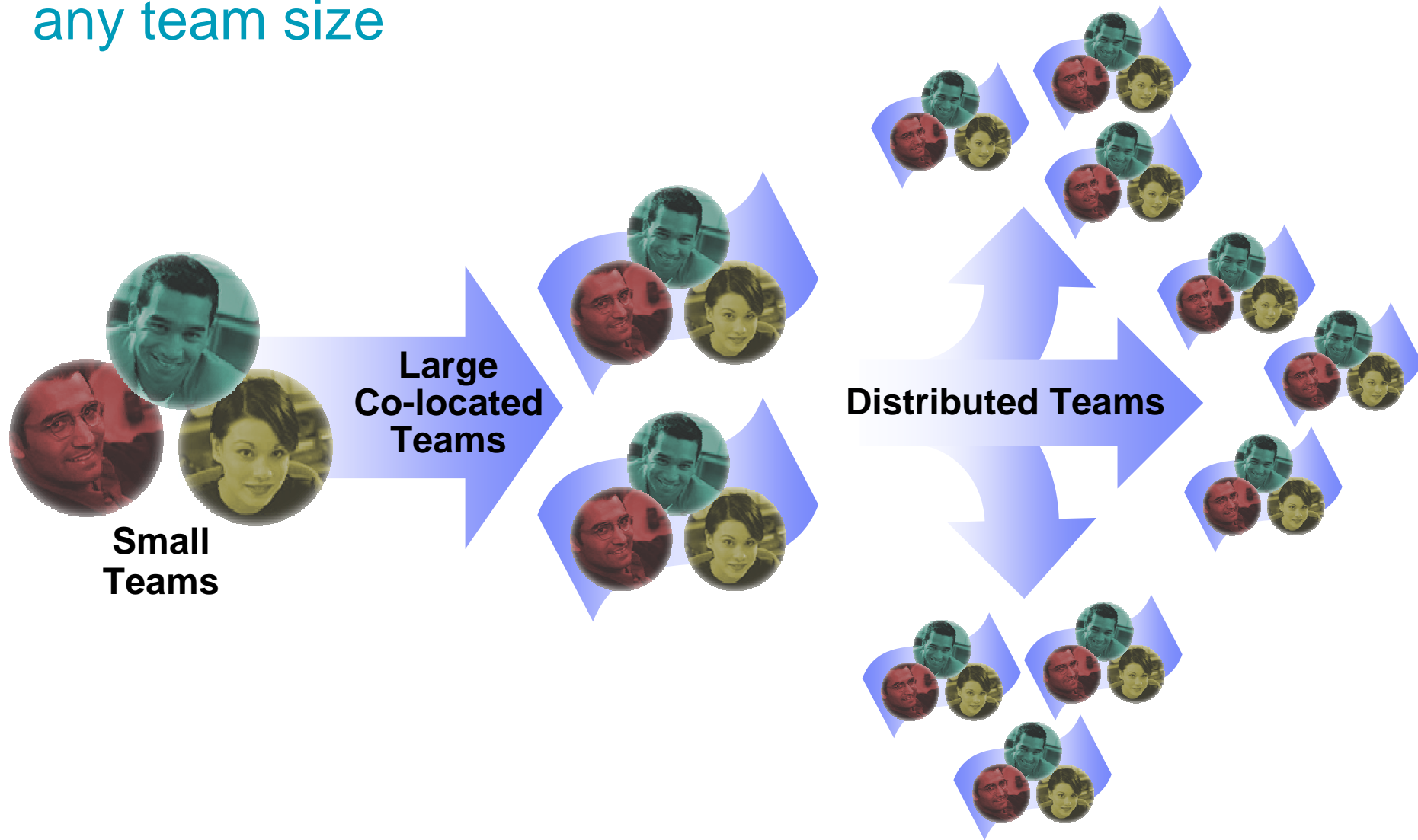
Legacy z/OS

z/OS

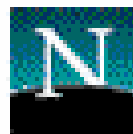
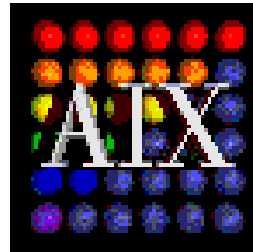
SCLM
AE



Rational Change & Release Management Scales to any team size



Operates on Your Platforms







Thank You

Robert Kennedy
kennedyr@us.ibm.com

What is the CQ CrossPlatformSCM Package?

- Extends CQ to SCLM
 - ▶ Provide a single CRM solution to manage artifacts across mainframe and distributed platforms
- Enables Building and Promoting of ClearCase artifacts

Highlights

- Single point of integration is CrossPlatformSCM enabled schema
 - ▶ Configuration records – stores connection / invocation / view details
 - SCLMBuildConfig, CCBuildConfig
 - ▶ CrossPlatformBuild record – parent record used to synchronize builds/promotes of multiple children
 - ▶ SCLMBuild & CCBuild record – child records of CrossPlatformBuild parent
 - Each associated with a configuration record
- Can be integrated with any ClearQuest workflow



Highlights

- Supports Online (synchronous) mode as well as Batch (asynchronous)
 - ▶ Online – client connection is maintained while command is run on host.
 - ▶ Batch – client connection is closed after command is invoked.

SCLM Interface

- Connects to SCLM via a HTTP Server running on z/OS
- Exploits new API included with SCLM
 - ▶ Delivered via PTF for APAR OA09303 on z/OS V1R5.0 and V1R6.0
- PERL scripts handle parsing responses from SCLM and updating records

SCLM Interface

- SCLMBuildConfig record
 - ▶ Configuration name (unique), Host name, port number,
 - ▶ SCLM UserID, SCLM password (Base64 encoded and sent with request)
 - ▶ Project and Project Definition
 - ▶ Build/Promote Options, Build/Promote JCL (Job Control Language)
- SCLMBuild record
 - ▶ Points to a SCLMBuildConfig record by name,
 - ▶ SCLM Group, Type, Member name (source file or module), and Batch/Online specified

ClearCase Interface

- Connects through parent OS process which forks off a child process to run the executable in a command shell.
- CCBuildConfig record
 - ▶ Configuration name, ClearCase build and promote views/commands specified
- CCBuild record
 - ▶ CCBuildConfig (using Configuration name), Owner, etc. specified

ClearCase Interface

- Support specifying and executing any build or promote type command
 - ▶ Build: ant, make, clearmake, javac, PERL scripts, etc
 - ▶ Promote: findmerge, deliver, PERL scripts, etc
- Local directories also supported
- Record states change depending on whether or not the command ran successfully, not on what the result of the command was
 - ▶ Limitation to be addressed in follow-on release

Primary Use Cases

- Create Configuration/Build records
- Online or Batch Build and Promote of SCLM artifacts
- Build and Promote of ClearCase or artifacts residing on the local hard drive
- Status refresh of Batch Build and Promote operations