The Collaborative Change and Release Management

*Accelerating the software and systems delivery lifecycle*

Kedar Walimbe
Technology Evangelist
Agenda

- Introductions
  - The Challenges of Delivering Quality Software
  - IBM Rational Software – Our Unique Value
  - Overview of Change and Release Management
  - IBM Rational Solution Overview
  - Technology Review - IBM Rational ClearQuest
  - Technology Review - IBM Rational ClearCase
  - Technology Review - IBM Rational Build Forge
  - Next Steps
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Business realities

Software impacts the bottom line

- **Airbus**
  
  Non-compatible software used at different Airbus factories
  
  $6.1 \text{ billion}$ profit-hit over the next four years, 2006

- **J Sainsbury PLC (UK)**
  
  Supply-chain management system abandoned after deployment
  
  $527 \text{ million}$ cost, 2004

- **Hewlett-Packard**
  
  Problems with ERP system
  
  $160 \text{ million}$ loss, 2004

> Software related downtime costs industry almost $300 \text{ billion} \text{ annually}

> Only 34% of software project succeed

Why is it so difficult to deliver quality software?

**Typical Challenges**

- Manual, error-prone tasks and processes
- Inconsistent processes for different Teams, products and projects
- Silos between development, build, test and deployment teams
- Difficult and time consuming defect and issue resolution
- Short deadlines and managing constant change
- Compliance and governance mandates

**Business Impact**

- Delays and missed deadlines for software releases and updates
- Costly support, troubleshooting and maintenance
- Bottlenecks, error-prone hand-offs and lack of visibility lead to delayed releases and customer satisfaction issues
- Unpredictable product release cycles, limited repeatability and portability
- Requires better tracking and auditing throughout the development lifecycle
Integrating across the complete **Application Lifecycle Management** is Challenge…

Lifecycle integration is not just about a handoff. Integration has to occur at the information, technology and process levels.
Collaboration Required
- Not just an organization problem

CEO
Maximize profitability through the predictable use of IT assets

Business Managers
Make the right IT investments

CIO
Deliver the right solutions and great service

Application Development Mgrs.
Accelerate time to value

IT Operations Mgrs.
Minimize costs and minimize disruptions

Analysts

Architects & Developers

Testers

Deployers

Operations Personnel

Governance Integration
How can I make sure we are doing the right thing?

Lifecycle Integration
How can I make these processes faster and more effective?
Can you achieve this Traceability?

This is IBM Rational Change and Release Management Solution
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IBM Rational Software

Our unique value

IBM Rational software is a **pioneer in technology** and **partners** with its customers to address and **solve the challenges** of developing and delivering quality software and systems.

- **Decades of proven technology leadership**
- **Revenue strength with strong R&D investments**
- **Large installed-base with thousands of customers**
- **World-wide technical expertise and support**
- **A complete end-to-end lifecycle solution**
IBM Rational Software Delivery Platform

*Complete end-to-end lifecycle solution*

Offering an array of products, services, and best practices, this open, modular, and proven solution spans the entire software and systems delivery lifecycle.
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Types of Changes

- **Operations**
  - Problems, Trouble Tickets, Issues, Change requests…
  - Applications deployments, OS patches, security Upgrades…

- **Development**
  - Defects, change requests, features, Requirements,…
  - Releases, Builds, Patches, Bug fixes, Enhancements…
  - Test Plans, Test cases, Test scripts,…
  - Source Code, Configuration Files

- **Business**
  - Proposals, New Ideas, projects
  - Business Process Change…
Single IT Change Management Solution
What is Change and Release Management?

Software Change Management
Change tracking and automation of development processes across the application lifecycle

Build and Release Management
Streamlines software delivery by automating, accelerating and executing build and release processes

The comprehensive integration with best practice guidance of software configuration management, software change management, and automated build and release management capabilities

Software Configuration Management
Sophisticated version control and parallel development support to manage and control software assets

Application Deployment Management
Tracking and automating of deployment processes across the application lifecycle
The evolution of Change and Release Management

Flexible options as you grow

- World-wide access
- Automatic synchronization
- Open scalability
- Integrated for traceability
- Managed and optimized
- Repeatable, shared process
- Repeatable and reliable
- Best-in-class tools
- Automated process
- Manual process
- Non-repeatable
- Error prone

Business and Technical Drivers

- Distributed Teams
- Compliance and Regulations
- Application Complexity
- Team Size

Process Maturity

- Informal Process
- Basic version control and defect tracking
- Integrated Change & Release Management
- Distributed Change & Release Management

Flexible options as you grow
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IBM Rational ClearQuest
Comprehensive IT Change Management

An industry-leading solution that provides flexible change tracking, process automation, reporting and lifecycle traceability for better visibility and control of the Software and Systems Management Lifecycle

✓ **Automated workflows** and e-mail notifications enhance team communication and coordination

✓ **Test management** unifies testing activities, from planning through results, for improved software quality

✓ Access control, **Electronic signatures, repeatable processes and audit trails** simplify compliance management

✓ **Integration with requirements, development, build, test, deployment and portfolio management tools** facilitates rapid response to change

✓ **Real-time reporting and process enforcement** improves project visibility and control
IBM Rational ClearCase
Complete Software Configuration Management

An industry-leading solution that provides sophisticated version control, workspace management, parallel development support to improve productivity

- Integration with leading IDEs allows you to work in your preferred environment
- Transparent real-time access to files and directories virtually anywhere in your organization
- Scales to any size team from small workgroups to distributed enterprise teams
- Sophisticated branching and graphical merge tools enable concurrent access to files and efficient use of time
- Light-weight feature-rich clients allow you to work locally or remotely
- Support for open source environments provides added workspace flexibility
IBM Rational Build Forge

*Full Build, Release and Deployment Management*

A process execution framework that automates and accelerates build and release processes for iterative development and streamlined software delivery

- Automation of build processes and configurations with push-button execution increases efficiency and reliability
- A reliable record of release contents facilitates accurate testing, problem resolution and compliance management
- Enterprise reporting improves visibility and identifies bottlenecks for improved operations over time

**Automation of deployment of artifacts through Development, Build, Testing and Deployment Environments**

- Integration with existing development technologies leverages existing investments and enables quick startup
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IBM Rational ClearQuest
Single solution to manage change across your Organization

- Consolidated, real-time view of the entire IT Change Management
- Traceable, auditable relationships between requirements, development, testing, building and project artifacts
- Integrations with Help Desk Systems
  - Integrations with requirements, development, build, test, deployment and portfolio management
  - Comprehensive quality metrics in project dashboards and reports
  - Manage test planning, test results, quality metrics, and defects
  - Secure, central repository

- Integration with Rational Asset Manager (RAM)
  - maximizes asset reuse
- Enhanced integration with Rational Portfolio Manager
  - maximizes project management
Change Request Workflow

- Submitted
- Assigned
- Opened
- Resolved
- Closed
- Postponed
- Duplicated

Actions:
- Postpone
- Assign
- Open
- Resolve
- Validate
- Duplicate
- Unduplicate
- Close
- Reject
Improve individual and team effectiveness
Know what to work on and when...

- To-do list
  - “What Change requests have been assigned to me?”
  - “What should I work on first”
Integration with Help Desk Systems

Submits a request for change

User receives E-mail confirmation of Change

Service Request Management
Change Management

Rational ClearQuest

Service Desk
Client Story – end to end…

CQ-Remedy Integration

Risk, Priority, Ownership, Start/End Date, Auto email, cross-team coordination, etc.

NO

Requirements approved?

YES

Entered into ReqPro

Move Object: Approval to move from Dev to QA to Production environment

Move to Production

Remedy Chang#

Development Group receives approved requirements

CQ State= Assigned to Development

Viewed in Sharepoint by user

Development and Testing

CQ State= WIP

UAT

CQ State= Ready for UAT

Test Manager

Horizontal Traceability

Auto Create Defect Record

Associate with request record; phase when defects found and injected; defect type and root cause

IBM Software Group | Rational software
IBM Rational ClearQuest  
*Unify testing activities for improved software quality*

- **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
Test Management with ClearQuest
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
IBM Rational ClearQuest
*Extensible Test Management ecosystem*

Integrated with Rational testing tools, open source and 3rd party test automation tools

Benefits:

- Lowers the cost of test lab Management
- Simplifies the Management of tools from multiple vendors

- Integrated with Rational Functional Tester, Rational Manual Tester and Rational Performance Tester
- Supports distributed, System z and System i testing
- Partner extensibility for inclusion of complementary testing tools
IBM Rational ClearQuest
*Simplify security and compliance management*

Repeatable, reliable and enforceable processes

- **Electronic Signature**
  - Choose what records and states require Electronic Signature approval

- **LDAP Authentication and User Authorization**
  - Rational ClearCase and Rational ClearQuest secured login

- **Audit Trail and Field Logging**

- **Secure Repository**
  - Supports popular database vendors
Lifecycle Traceability

Query one source for all aspects of project progress

- Query to find
  - Test results associated to requirements
  - Defects associated to test results
  - Defects associated to tests associated to requirements

- Traceability from requirements to tests and defects closes the loop on the software development cycle
Build & Deployment Automation
Types of Changes

- Operations
  - Problems, Trouble Tickets, Issues, Change requests…
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- Development
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  - Test Plans, Test cases, Test scripts,…
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  - Source Code, Configuration Files

- Business
  - Proposals, New ideas, projects
  - Business Process Change…
System Deployments become increasingly complex

A Composite Web Application, Involving J2EE, Integration Middleware, and Legacy Systems
Define the release

Project Manager creates a Release record to represent the release

Choosing a UCM Project to associate with the release provides a link to UCM activities
Define the roles

Defining role names modeled on the role hierarchy in your organization

Project Manager creates one or more Roles and associate them with a Release
Define environments

Project Manager creates one or many Test Environments for a Release

System Test → Integration Test → Pre-Production → Production
Structure of objects

- Release
- Roles
- Test Environments
Build Tracking in ClearQuest

- **Release**
- **Deployment Record**
- **Approval**
- **Project**
- **Environment** (Function Test, Performance Test, Production)
- **Role** (Dev, QE, Project Manager, Operations Manager)
- **Build Tracking in ClearQuest**
- **Team Member**
Build Record

States communicate status of the build: Submitted Complete, Failed, Retired

Aggregate build records for each release
Summary of Release Management Structure

- **Rational Bank 1.5 Release**
- **System Test Environment (Sequence: 1)**
- **Operations Manager**
  - **Project Manager**
  - **Test Manager**
    - Approves deployment to System Test Environment
      - **Role**

- **Rational Bank 1.5 Build Record**

**Notes:**
- From Pre-production to Environment
- System Test Environment
- Operations Manager
- Project Manager
- Test Manager
- Role

**Roles:**
- Operations Manager
- Project Manager
- Test Manager
- System Test Environment
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IBM Rational ClearCase
Activity-Based Change Management

Unified Change Management (UCM)
- Customize without scripting
- Organize and prioritize development activities
- Efficiently manage files and project artifacts

- Never forget a file again

- Assemble Systems Consistently
- Manage Baselines
- Maintain Build Audit Trail

Developers
- Organize Projects
- Track Project Status
- Easy to Adopt

Project Manager

Integrator
IBM Rational ClearCase
Flexible alternatives for implementation

Rational ClearCase supports two implementation methods:

- Unified Change Management (UCM)
  - Out-of-the-box solution
  - Activity-based change management process
  - Configurable automated workflow process
  - Proven best practices
  - Increased abstraction Level - UCM is layered on base Rational ClearCase

- Base Rational ClearCase
  - Flexibility to implement virtually any configuration management solution tailored to a particular development environment
    - Unlimited and automated branching
    - Customize to your needs
IBM Rational ClearCase
Work simultaneously on multiple releases

Accelerate your productivity with parallel development

- Isolate unstable work with private developer workspaces
- Automate team coordination using sophisticated branching and graphical merge tools
IBM Rational ClearCase
*Work in your preferred environment*

- Integrations with leading IDEs
  - Eclipse framework
  - IBM Rational Application Developer (RAD)
  - Microsoft Visual Studio 2005
  - Rational Developer for System z
  - WebSphere Studio Developer Client (for System i)
  - z/OS ISPF
  - and more….

- Wide-range of supported environments
  - UNIX
  - Windows
  - Linux
  - i5/OS
  - IBM z/OS® development support including ISPF client and z/OS build agent

- Work locally or remotely
IBM Rational Software Configuration Management

*From workgroups to distributed enterprise teams*

- **Rational ClearCase LT**
  - Snapshot Views
  - Activity-Based Change Management (UCM)
  - Single Server
  - Small Teams

- **Rational ClearCase**
  - Distributed Team Development
  - Dynamic Views
  - Distributed Servers
  - Small-Large Teams

- **Rational ClearCase MultiSite**
  - Replication and Synchronization
  - Replicated Servers

Add-on
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IBM Rational Build Forge
An adaptive framework to standardize and automate repetitive tasks

SOFTWARE DELIVERY AUTOMATION FRAMEWORK

Management Console
Centralized Web-based Management, Collaborative Distributed Access, Role-Based Security

IDE Plug-Ins
Developer Self-Service, Role-Based Security

Control Acceleration Environment Notification Scheduling Log Analysis Tracking Analysis

Process Automation
Automated, Distributed, Repeatable, Consistent Software Delivery Lifecycle

Development Source Control Product Build Quality Assurance Package Release

Scripting
Python, VBscript, Batch, Perl, KSH

Languages
- Java
- C
- C++
- C#
- etc.

IDEs
- RAD
- Eclipse
- Visual .NET

Source Control
- ClearCase
- StarTeam
- Perforce
- CVS
- PVCS
- VSS
- Synergy
- Subversion
- etc.

Change Mgmt
- ClearQuest
- Remedy
- ChangeMan
- DevTrack
- Bugzilla
- etc.

Build Tools
- ClearMake
- Ant
- NAnt
- Make
- GNU Make
- NMake
- Open Source
- CruiseControl
- Maven
- etc.

Test Tools
- TestManager
- Performance
- Functional
- Robot
- LoadRunner
- TestDirector
- WinRunner
- JUnit
- etc.

Package Tools
- Wise
- InstallShield
- jar
- RPM
- Package
- etc.

Package
- etc.

Release
- etc.

Platforms
- UNIX, Windows Mac, Linux, z/OS, i5/OS, Proprietary
IBM Rational Build Forge

*Improve visibility and decision support*

Fast analysis and insight to valuable build information

- Intuitive out-of-the-box reporting
  - Uncover development bottlenecks
  - Determine trends for specific projects
  - Pinpoint areas for performance tuning

- "Really Simple Syndication" (RSS) data feeds
  - Real-time notifications and monitoring
  - Works with any RSS-compliant reader/aggregator

- Advanced reporting with Rational Build Forge Quick Report
  - Quickly create, modify and run ad-hoc custom or out-of-the-box reports
  - Zero footprint web client
  - Public and private access to reports
  - Save/export to different formats
  - Add-on to Rational Build Forge

No Scripting!
IBM Rational Build Forge
Automated, documented data and audit trail

Better reproducibility and simplifying compliance management

- Comprehensive bill-of-materials (BOM)
  - files that were changed
  - any automated unit tests performed
  - environment used to create the build
  - thorough account of build processes

- Documented audit trail of release contents, process changes and user access to the systems

No need to manually gather information!
IBM Rational Build Forge
Direct access to build and release functions

Empower developers with self-service capabilities

- Integrations with leading IDEs
  - Eclipse framework
  - IBM Rational Application Developer (RAD)
  - Microsoft Visual Studio 2005
  - and more...

- Wide-range of supported environments
  - Windows
  - AIX
  - Solaris
  - HP-UX
  - UNIX
  - Linux
  - Mac OS
  - z/OS
  - i5/OS

Support for more environments than ANY other Build and Release Management tool!
IBM Rational Build Forge
Centralized management across geographically distributed teams

- Web-based management console
- Consolidated, real-time project view
- Safe, secure access via user authentication
- Unicode support for international projects - translated and available in 10 different languages!
Accelerate Deployments using IBM Rational Change and Release management Solutions

- Implement
- Build & Stage
- Provision & Validate Server(s)
- System Test
- Integration Test
- User Acceptance
- Defects
- Approve

Developer → Build Engineer → Deployer → Tester → Project Manager

In Production
Build, Release and Deployment Management

- **Release**
- **Deployment Record**
- **UCM Project**
- **Environment** (Function Test, Performance Test, Production)
- **Role** (Dev, QE, Project Manager, Operations Manager)
- **Build**
- **Approval**
- **Team Member**

Activities:
- Requirements, Defects, Bugs, Test Cases, Test Plans
- Change requests, etc.

Roles:
- Dev
- QE
- Project Manager
- Operations Manager
Deployment tracking

- For each Release, define the test environments and approvals needed
- Create Deployment records that track the state of a deployment through the test environments
- Create Deployment Units to describe which managed artifacts to deploy
- Optionally link the deployment record to build record(s) for traceability between the build and the deployment
Track deployments

Deployment records track each deployment

- Indicates current state for the environment
- Records move through the predetermined environments
- Approvals provide auditable gates for deploying into an environment
- Versioned Deployment Units identify build artifacts to deploy
Sample Scenario

1. **RatiBank1.5 Release**

2. **RatiBank1.5 Deployment Record**
   - Approval from **Dana** to Deploy to **System Test Environment** (Sequence: 1)

3. **System Test Environment** (Sequence: 1)
   - Dana

4. **Test Manager**
   - Test Manager approves deployment to System Test Environment
   - Operations Manager
     - Operations Manager approves deployment to Pre-Production Environment
   - Project Manager
     - Project Manager approves deployment to Pre-Production Environment
   - Test Manager

5. **Approval from **Pat** to Deploy from System to **Integration Test Environment** (Sequence: 2)

6. **Integration Test Environment**
   - **Pat**

7. **Approval from **Lou** to Deploy from Integration to **Production Environment** (Sequence: 3)

8. **Pre-Production Environment**
   - **Lou**

9. **Production Environment**
   - **Lou**
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Summary

Next Steps
What is Change and Release Management?

**Software Change Management**
Change tracking and automation of development processes across the application lifecycle

**Build and Release Management**
Streamlines software delivery by automating, accelerating and executing build and release processes

The comprehensive integration with best practice guidance of *software configuration management*, *software change management*, and automated *build and release management* capabilities

**Software Configuration Management**
Sophisticated version control and parallel development support to manage and control software assets

**Application Deployment Management**
Tracking and automating of deployment processes across the application lifecycle
IBM Rational ClearQuest and BuildForge

One bundle for comprehensive Change Management

- Enterprise scalable, distributed test management
- Test process enforcement and customization
- Quality metrics
- Integrated test management and test automation tools
- Build and Release Automation
- Auditable and Predictable Release Management Process
IBM Rational Change and Release Management
Additional information

For additional information on the IBM Rational Change and Release Management solutions please refer to the following websites:

IBM Rational Change and Release Management:

IBM Rational ClearCase:

IBM Rational ClearQuest:

IBM Rational Build Forge:
IBM Rational Change and Release Management

Additional resources

For additional resources related to the IBM Rational Change and Release Management solutions please refer to the following websites:

IBM Rational Change and Release Management Product Library:

IBM developerWorks for hints, tools, tips and tricks:
http://www.ibm.com/developerworks/

IBM Rational demos, evaluations, upgrades, patches, hot fixes, add-ins, plug-ins, models, scripts, and documentation:

The Eclipse open development platform:
http://www.eclipse.org
Questions

IBM Rational Change and Release Management
Thank You