



IBM Software Group

# *Extended support for Distributed Development*

Mark Roberts, Technical Manager, IBM Rational UK

**Rational** software



@.business on demand software

# Agenda

- ◆ The IBM Rational Software Development Platform
- ◆ Requirements Management : RequisitePro
  - Overview
  - Requirements management
- ◆ Configuration Management : ClearCase
  - Overview
  - Access to artifacts
  - Component management
- ◆ Change Management : ClearQuest
  - Overview
  - Integrated Configuration, Change and Requirements management
- ◆ Distributed Configuration and Change Management
- ◆ Enterprise Build Management : Build Forge



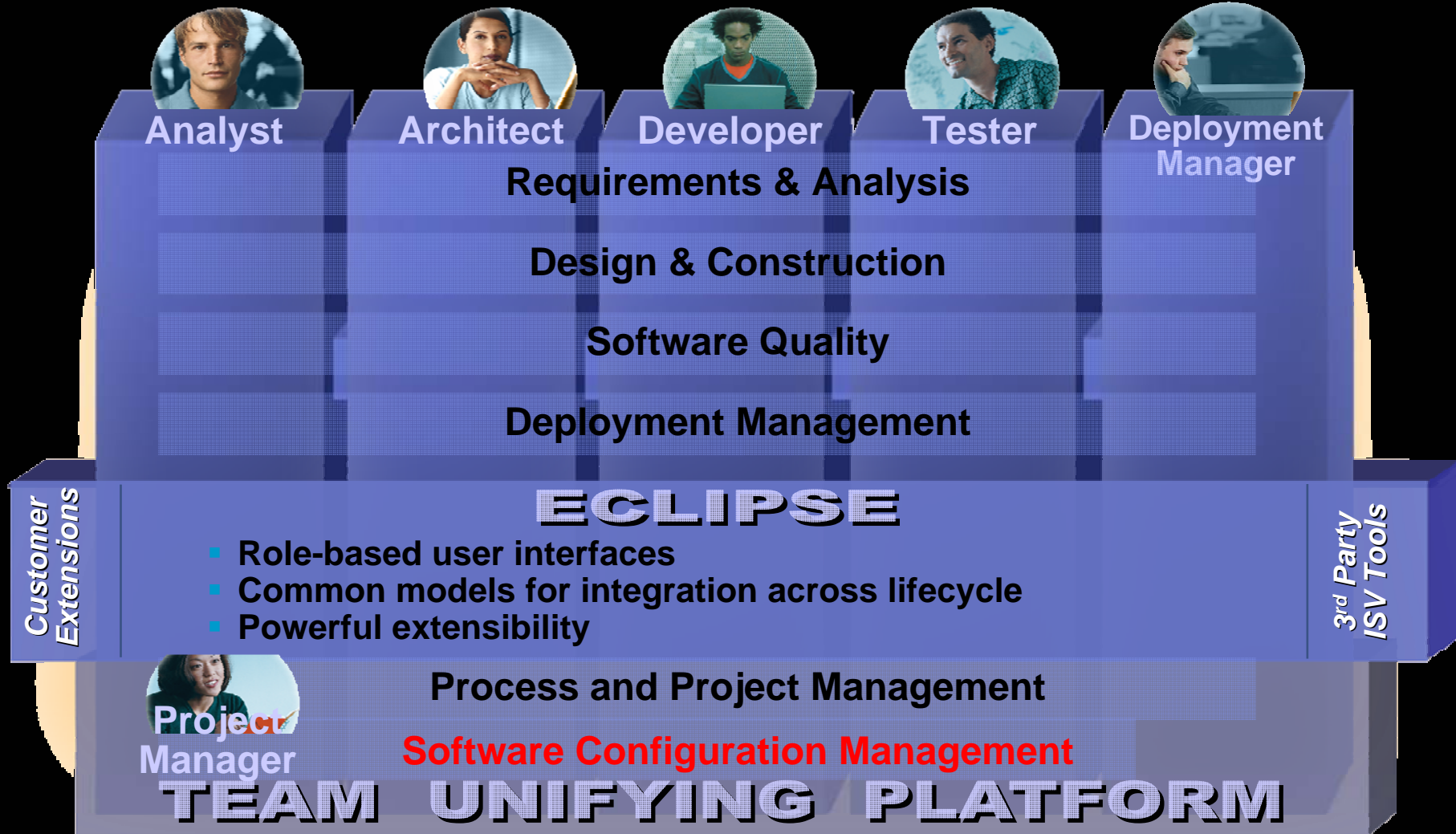
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# Delivering a Robust, Open Infrastructure

*The Eclipse Universal Framework*



# Agenda

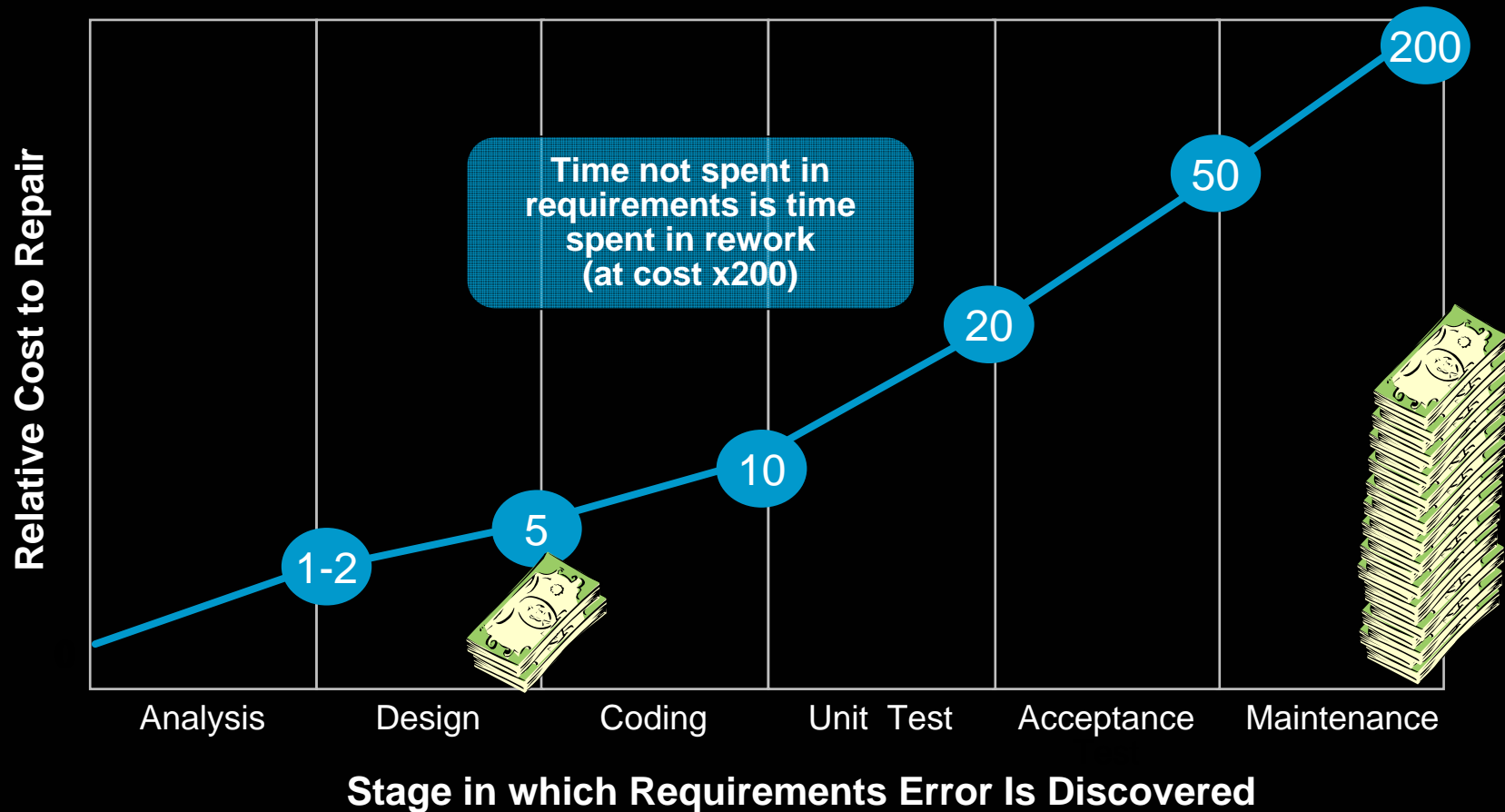
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# The Challenge: Managing Your Requirements

*Unmanaged requirements cause unmanageable budgets*

- ◆ Primary reason for excessive rework, delays, and poor quality



# Issues In Managing Requirements

- ◆ **Understanding and using requirements**
  - Requirements are located in many documents, charts, and models
  - Requirements lack context
  - Requirements not used by designers, developers and testers
- ◆ **Organizing and reporting on requirements**
  - Requirements are not assigned priority, risk and level of effort
  - Requirements don't have any definition or type
- ◆ **Managing changes to requirements**
  - No record of relationships or origin
  - Changes are not communicated in a timely manner
  - Impact of change is not assessed or is underestimated



***Unsolved RM Challenges → Software Rework → Cost, Delays, Quality Issues***



# Organizing Requirements

## *Types, Attributes and Views*

- ◆ User-defined requirement types
- ◆ User-defined attributes
- ◆ User-defined filters (views)
- ◆ Saved views

Rational RequisitePro - ClassicsCD Web Shop - [FEAT: Sorted by Priority and Difficulty]

File Edit View Requirement Traceability Tools Window Help

ClassicsCD Web Shop

- Business Context
- Coverage Analysis
- Design Elements
- Features and Vision
  - Administrative
  - Web Shop System
    - Vision
    - All Features\*
    - All High priority features\*
    - Sorted by Priority and Difficulty
- Glossary
- Impact Analysis
- Risks
- Supplementary Specifications
- Use Cases
  - Access Product Promotion
  - Arrange Shipment
  - Check Order Status
  - Purchase CD
  - Shop for CD
  - All Use Cases
  - Use Case Survey
  - Requirements Management Plan

Requirements:	Priority 1 - HIGHEST	Difficulty 1 - HIGHEST	Stability	Origin	Enhancement/Request
<b>FEAT13: Web Interfaces Compliance</b> ClassicsCD applications must comply with common web user interface such as Microsoft Internet Explorer and Netscape.	High	High	Medium	Hot Line	CL.SIC0000033
<b>FEAT15: Interactive Guide</b> The web site will include an interactive guide to the web site.	High	Medium	High	Competitors	CL.SIC0000090
FEAT2: Easy Browsing for available titles.	High	Low	High	Hot Line	
FEAT4: Ability to check the status of an order.	High	Low	High	Hot Line	CL.SIC0000036
FEAT9: Ability to add/remove offerings.	Medium	High	Medium	Hot Line	
<b>FEAT14: Supported Platforms</b> The web application will be supported on all operating systems that are supported by the chosen browsers.	Medium	High	Medium	Hot Line	
FEAT1: Secure Payment method.	Medium	Medium	Medium	Hot Line	
FEAT3: Search capabilities	Medium	Medium	Medium	Partners	CL.SIC0000032
FEAT5: E-mail notification for customers when new titles are added that may be of interest to them.	Medium	Medium	Medium	Hot Line	
FEAT6: Highly Scalable to include many titles and	Medium	Medium	Medium	Large Customers	

FEAT13: Web Interfaces Compliance  
ClassicsCD applications must comply with common web user interface such as Microsoft Internet Explorer and Netscape.

Ready 15 requirements

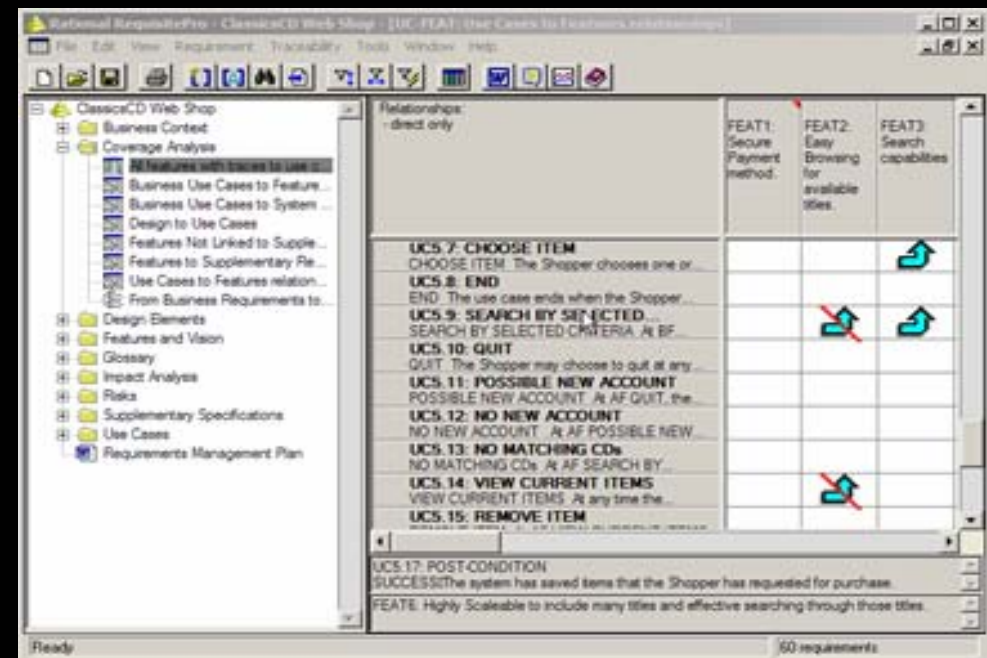
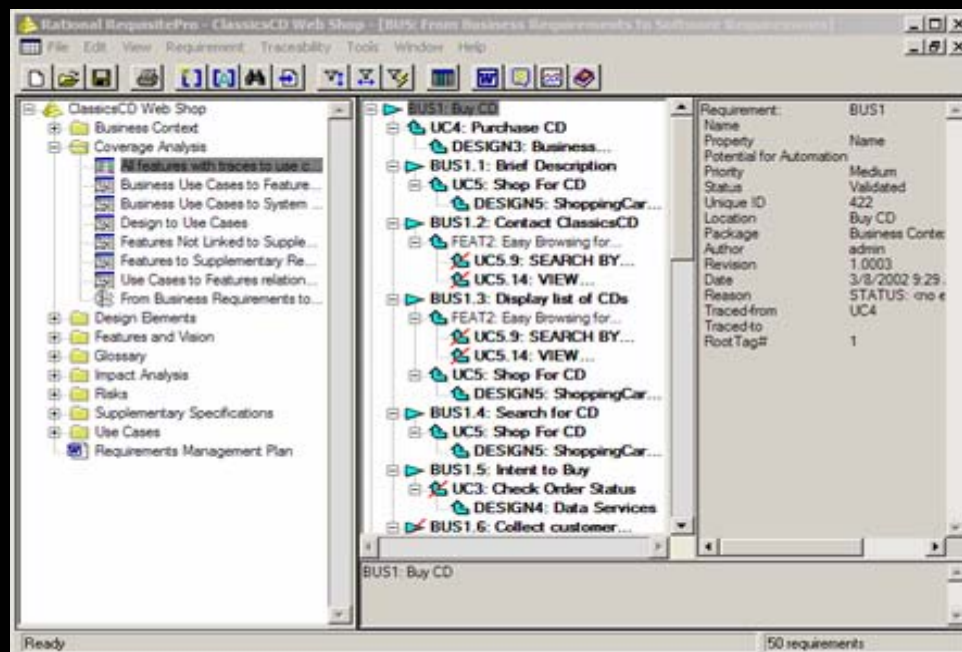




# Managing Changing Requirements

## Traceability

- ◆ Graphical trace matrix
- ◆ Textual trace matrix
- ◆ Graphical trace tree



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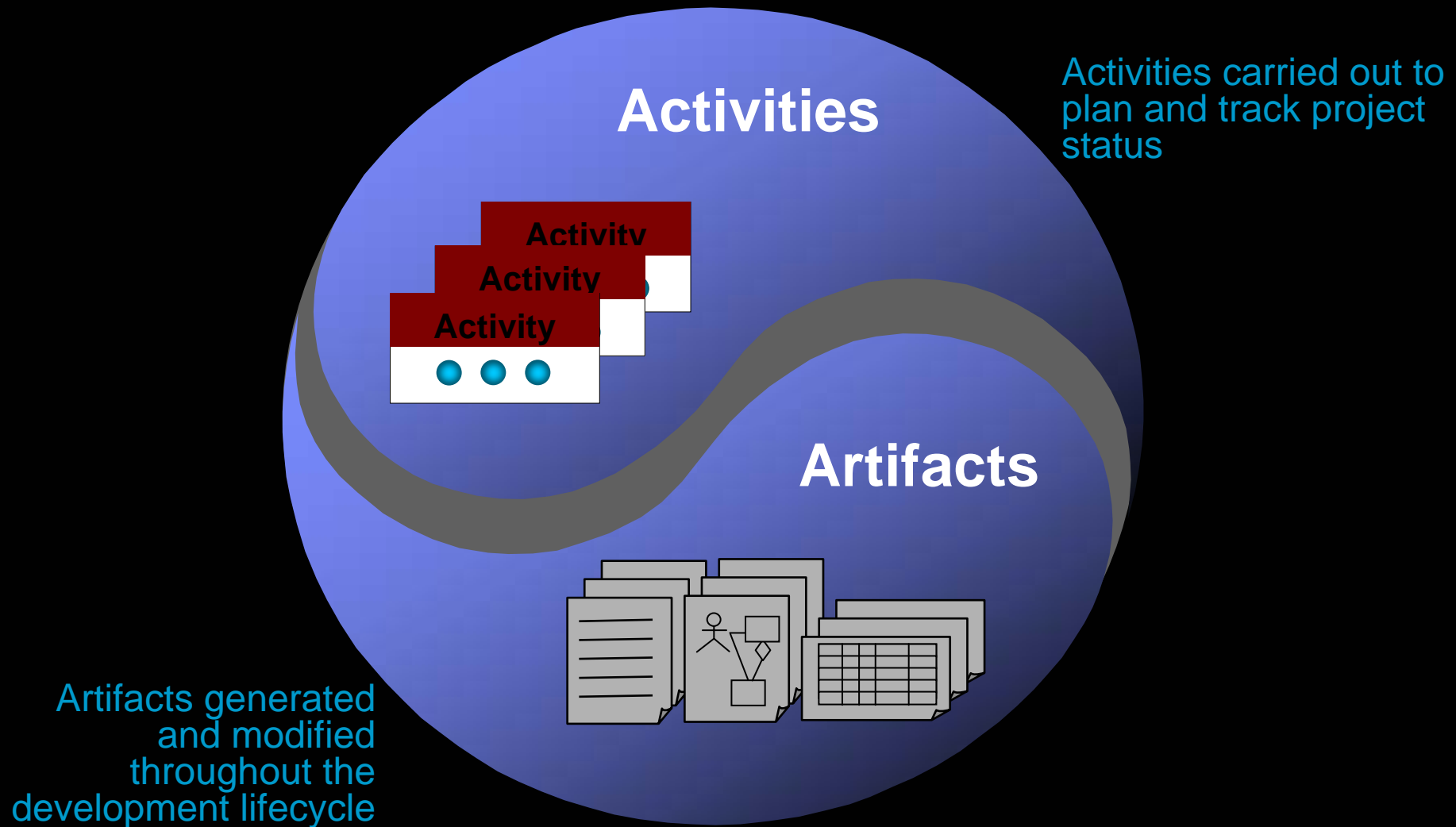
# IBM Rational ClearCase

- ◆ Easy to set up and use
- ◆ Robust, full-featured support for parallel development
- ◆ Out of the box process
- ◆ Customize to adapt to your process



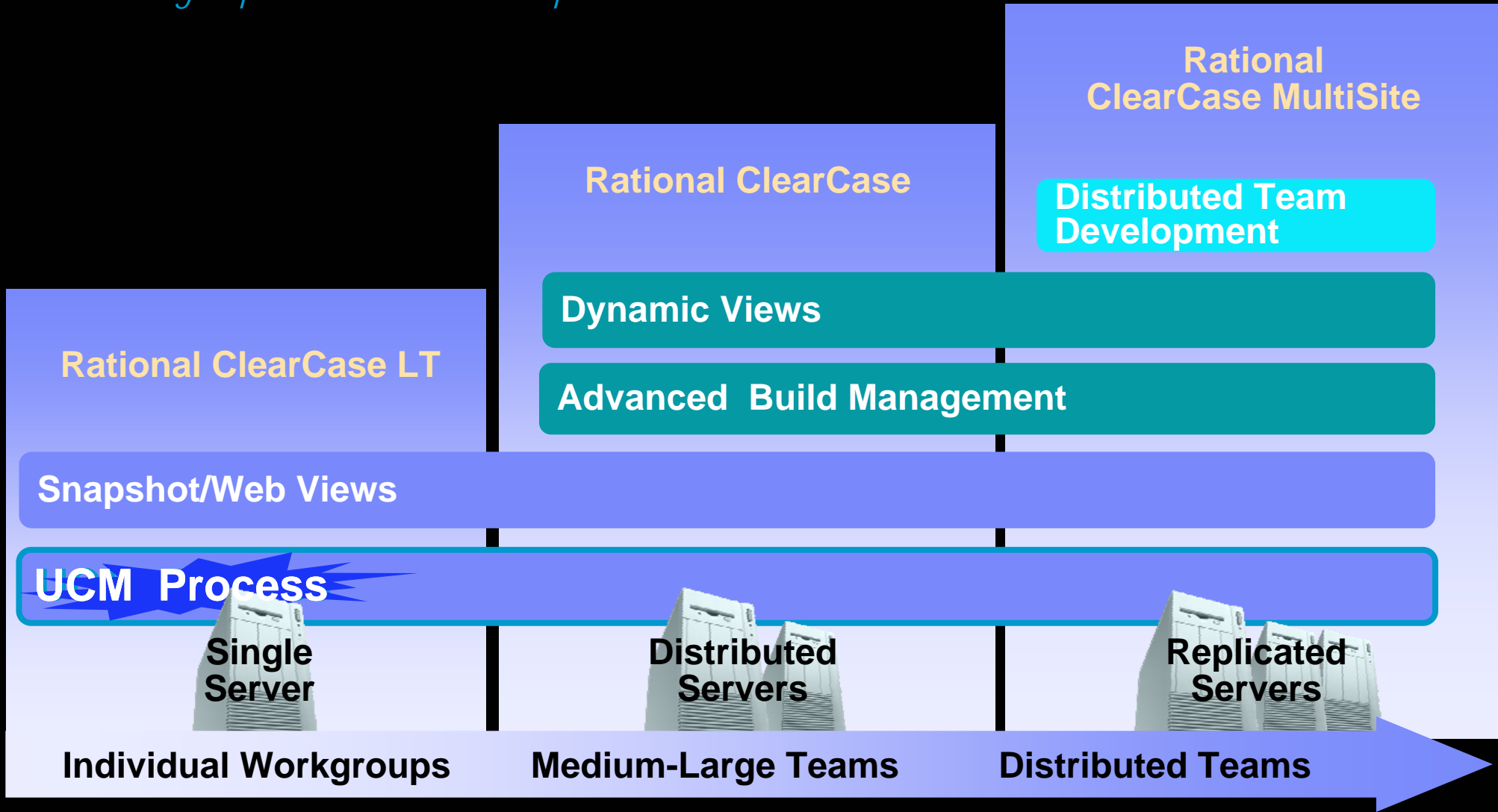
# Unified Change Management (UCM)

*Manage and control change at the activity level*



# Rational software configuration management

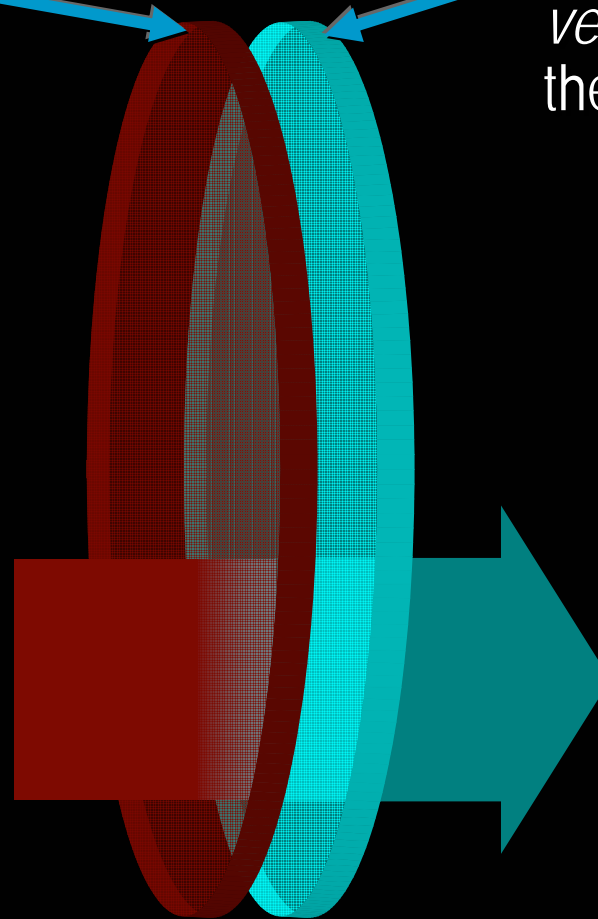
*From workgroups to distributed enterprise teams*



# Unique Workspace Management

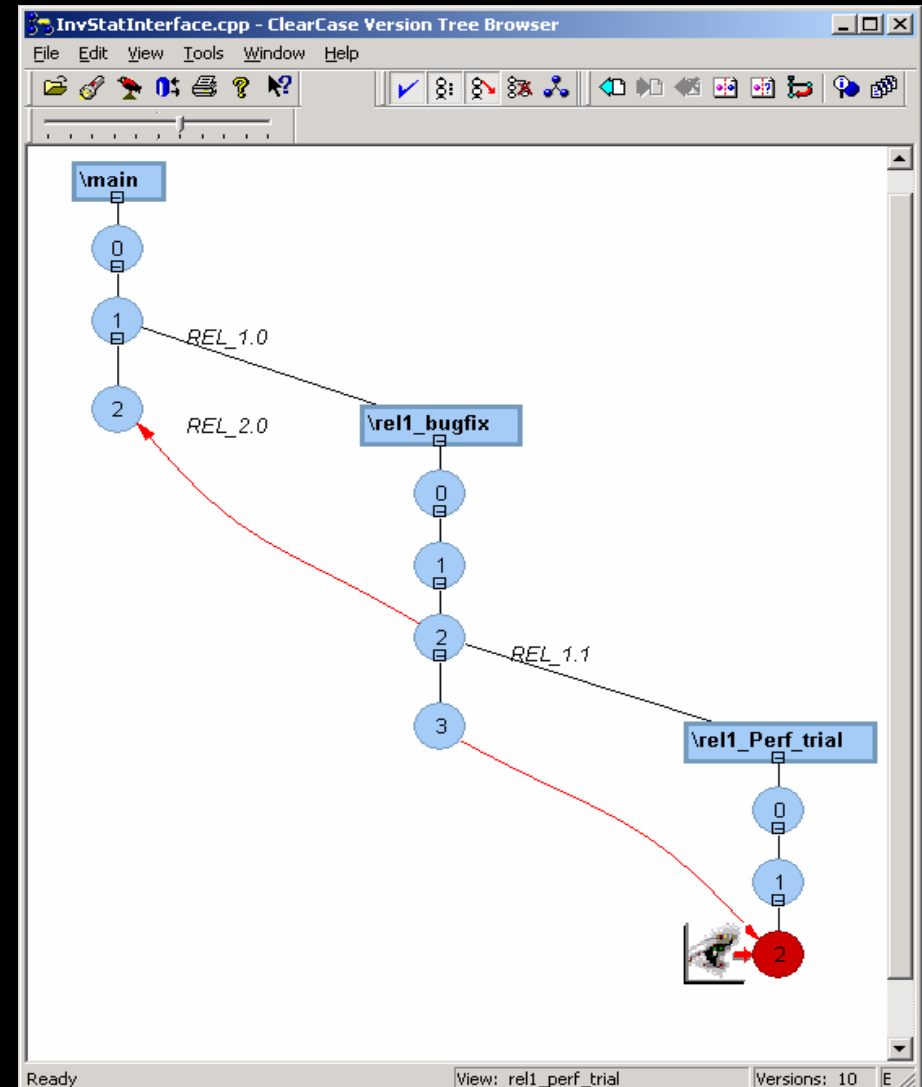
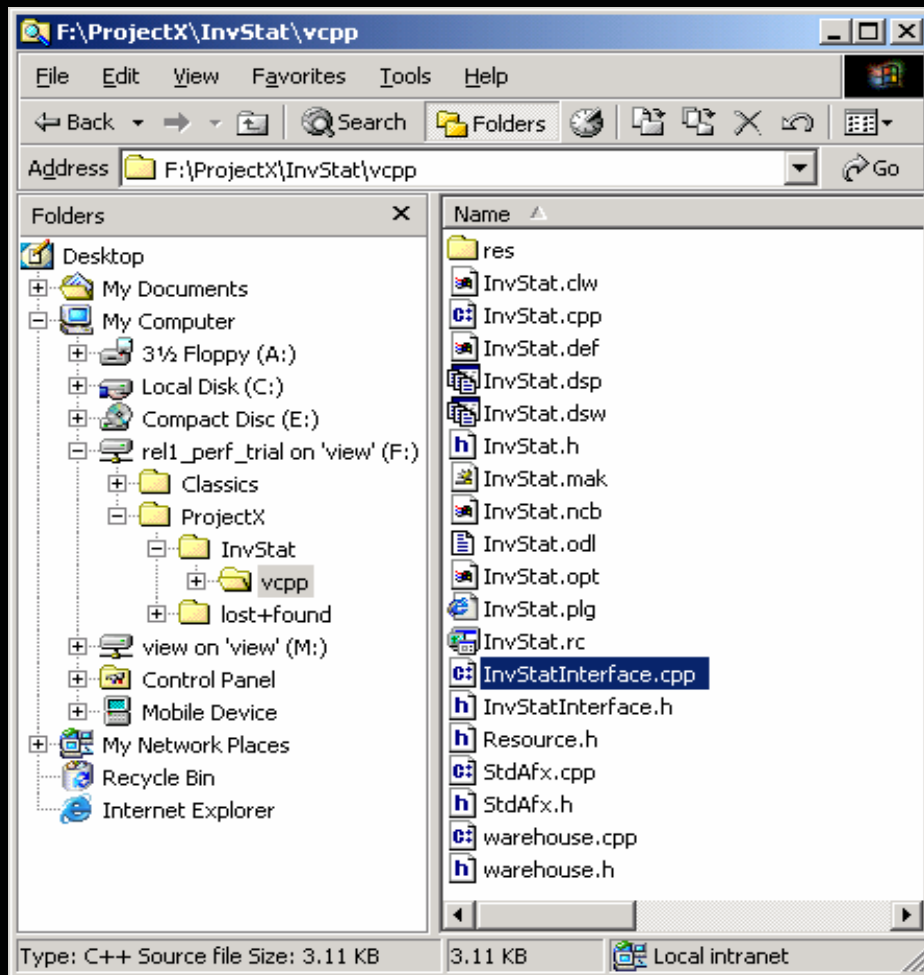
Users work within the context of the repository.

View process determines the *versions* of files presented to the user



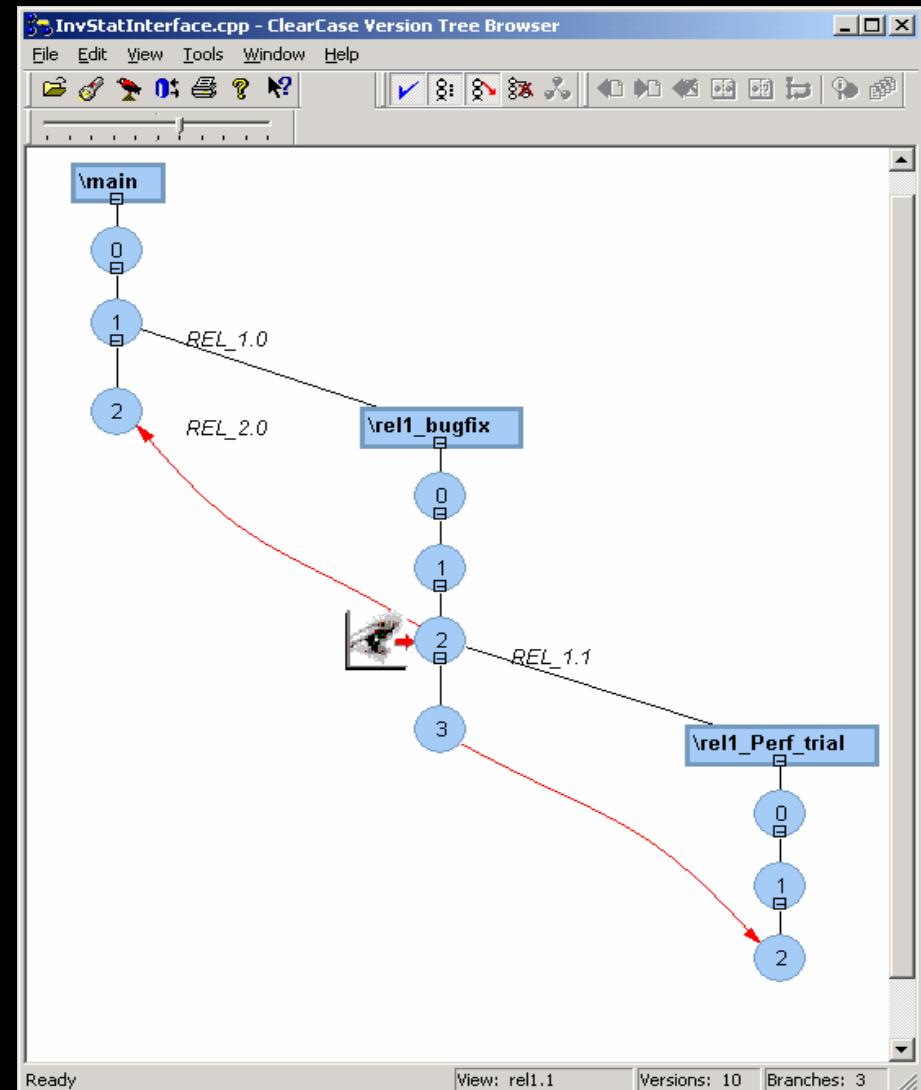
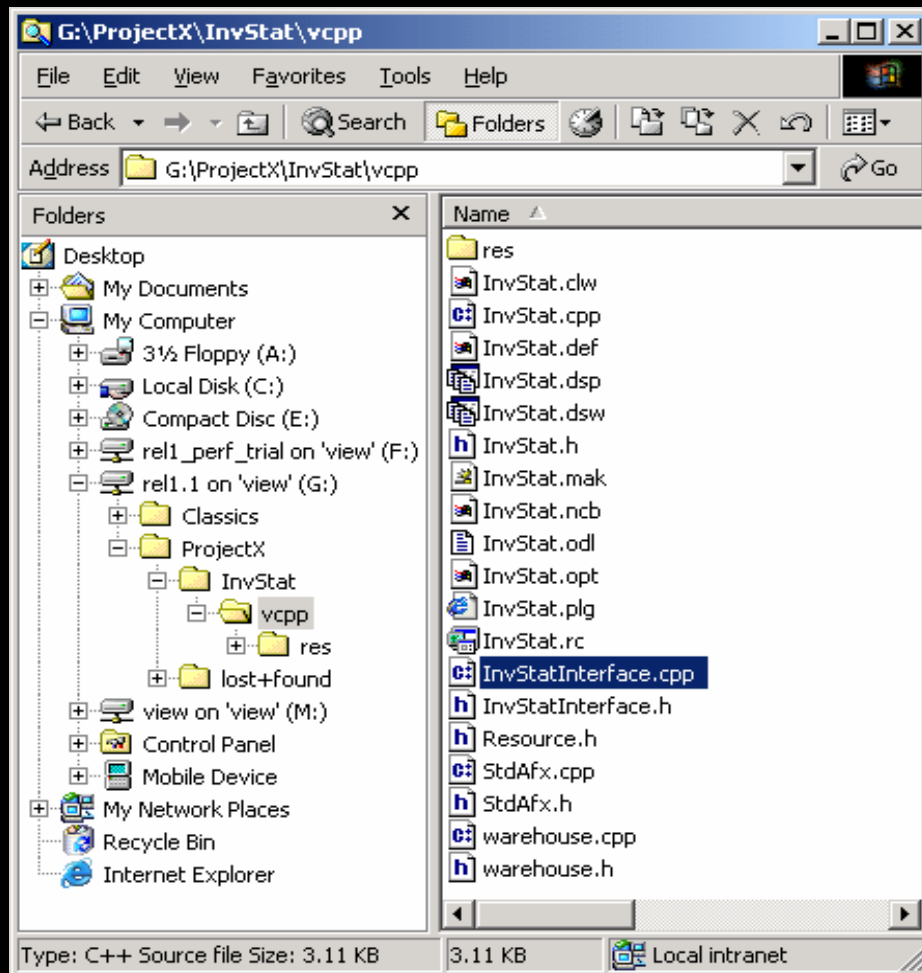
# ClearCase Views : *Access to all versions*

## Release 1.1 Performance trial



# ClearCase Views : *Access to all versions*

## Investigate release 1.1





# ClearCase Versioning

The screenshot shows a Windows Explorer window at the path `E:\db_source\src`. The file list contains:

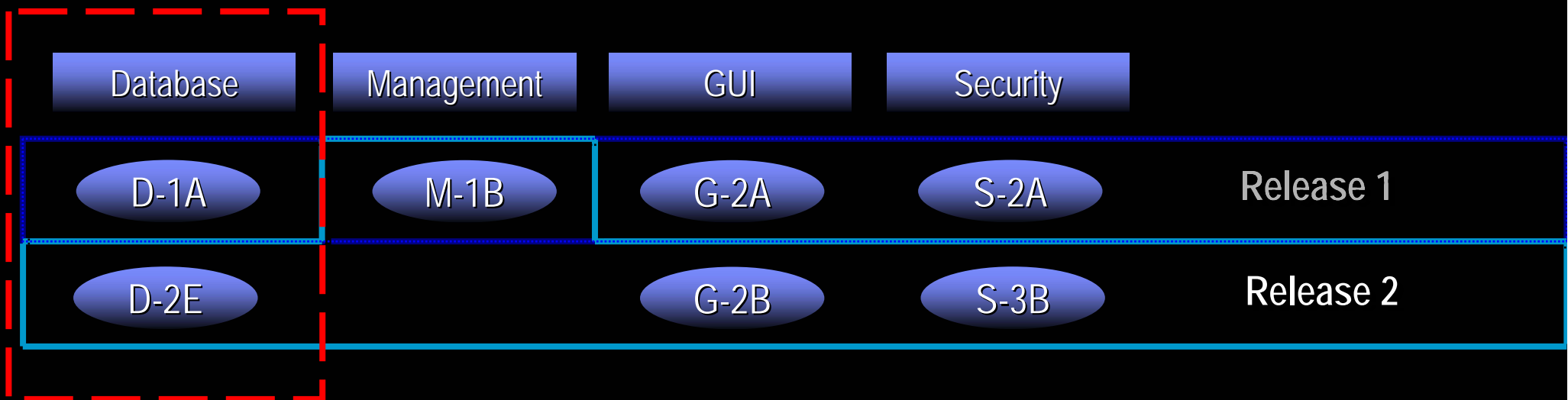
Name	Size	Type	Modified
nameapp.c	1 KB	C Source file	01/03/1998 22:10
screen.c	1 KB	C Source file	20/02/2001 16:32
shell.c	4 KB	C Source file	30/08/2000 12:24
shell.h	1 KB	C Header file	30/08/2000 13:02

The context menu for `shell.c` is open, with the **Check Out...** option selected. The **Check Out** dialog box is displayed, showing the file path `E:\db_source\src\shell.c` and a text area for a comment. The **Reserved** checkbox is checked, and the **Unreserved if already reserved** checkbox is unchecked.



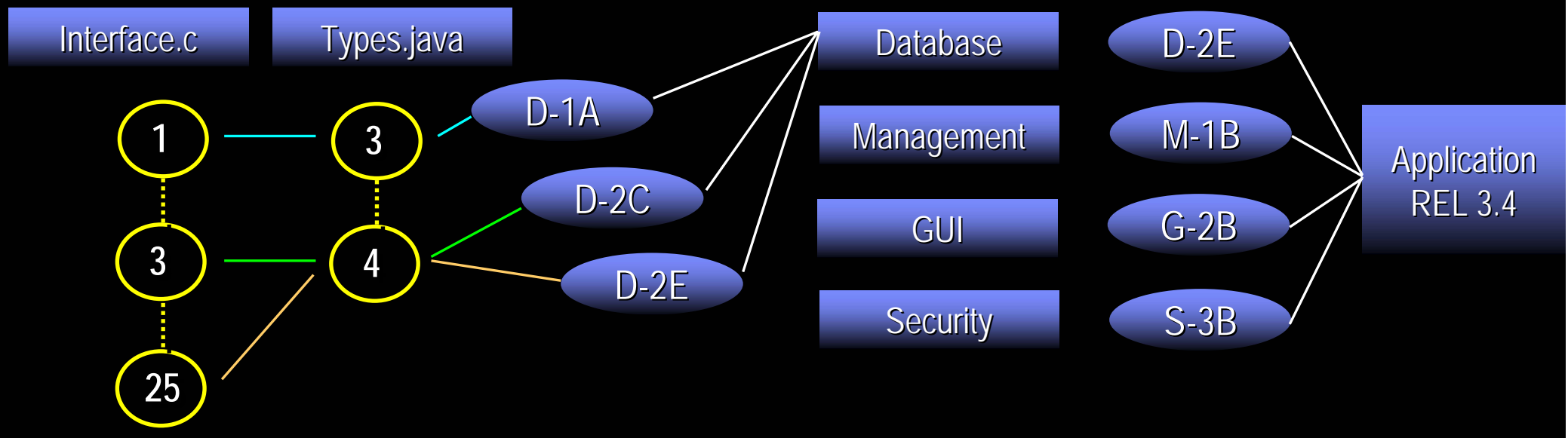
# Architectural Component Perspective

- ◆ Integrators 'think' components...
  - Visual representation of the system architecture
  - Clear breakdown of project scope
  - Clearly defined component boundaries
  - Projects work on components



# Component Baseline : Component Integration

- ◆ Strong project structure
- ◆ Clearly defined component interfaces
- ◆ Component security
  - Read / write or read only or totally hidden



# Reporting Scenarios

- ◆ Scenario 1 - Between release 1 and release 2 ...
  - ... 789 Files have been modified between
  
- ◆ Scenario 2 - Between release 1 and release 2 ...
  - 50 Activities have been completed
  - 40 defects fixed
  - 6 new features added
  - 2 customer enhancement requests
  - 2 training note changes completed
  - 4 defects held back for next release



# ClearCase Remote Client : Eclipse Interface

The screenshot displays the ClearCase Remote Client interface within an Eclipse IDE. The interface is divided into several panes:

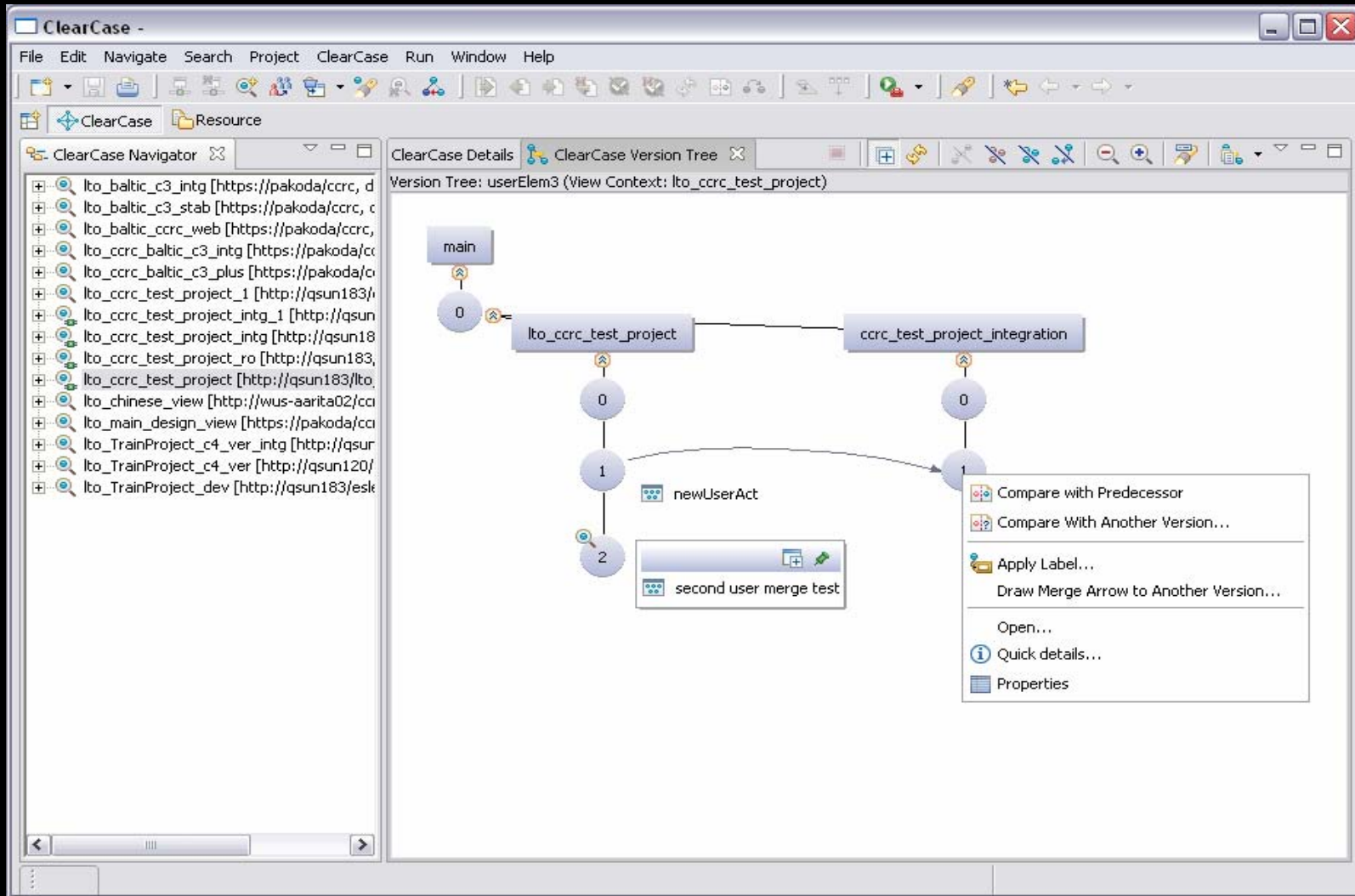
- ClearCase Navigator:** Shows a hierarchical tree of projects and folders. The selected path is `java\jsf\MessageCenter\JavaSource\model`.
- ClearCase Details:** A table showing file details for the selected path.
 

Name	Size	Kind	Modified Time	State
User.java	1450	File Element Version	07-Sep-2006 14:59:26	Loaded
Message.java	476	File Element Version	07-Sep-2006 14:59:27	Loaded
- ClearCase Metadata Explorer Details:** A table showing label types.
 

Name	Kind	Created On
ANT-1.5.2	Label Type	06-Oct-2004 10:13:04
ANT-1.5.3-01	Label Type	06-Oct-2004 13:01:40
ANT-1.5.4	Label Type	06-Oct-2004 13:15:34
ANT-1.6.0	Label Type	07-Oct-2004 09:48:05
ANT-1.6.1	Label Type	07-Oct-2004 10:26:55
ANT-1.6.2	Label Type	09-Aug-2004 18:49:17
ANT-1.6.2_CC_PATCHED	Label Type	09-Aug-2004 18:54:26
ANT-1.6.2-BUILT	Label Type	29-Sep-2004 09:27:22
ANT-1.6.2-CCAUDIT-BUILT	Label Type	05-Oct-2004 20:40:37
ANT-1.6.2-KL_PATCHED	Label Type	29-Sep-2004 14:18:03
ANT-1.6.2-KL_PATCHED-BUILT	Label Type	05-Oct-2004 15:16:15
CLEARCASE_SOURCEFORGE_0.9.7	Label Type	16-Feb-2004 08:14:05
CtCmd_V1.00	Label Type	15-Oct-2003 21:11:15
CtCmd_V1.01	Label Type	15-Oct-2003 21:11:15

A context menu is open over the `Message.java` file, showing options like `Connect...`, `Disconnect...`, `Open`, `Basic`, `Tools` (with sub-options like `ClearCase Search...`), `New`, `Edit`, and `Properties`.

# ClearCase Remote Client : Version Tree Browser



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# IBM Rational ClearQuest

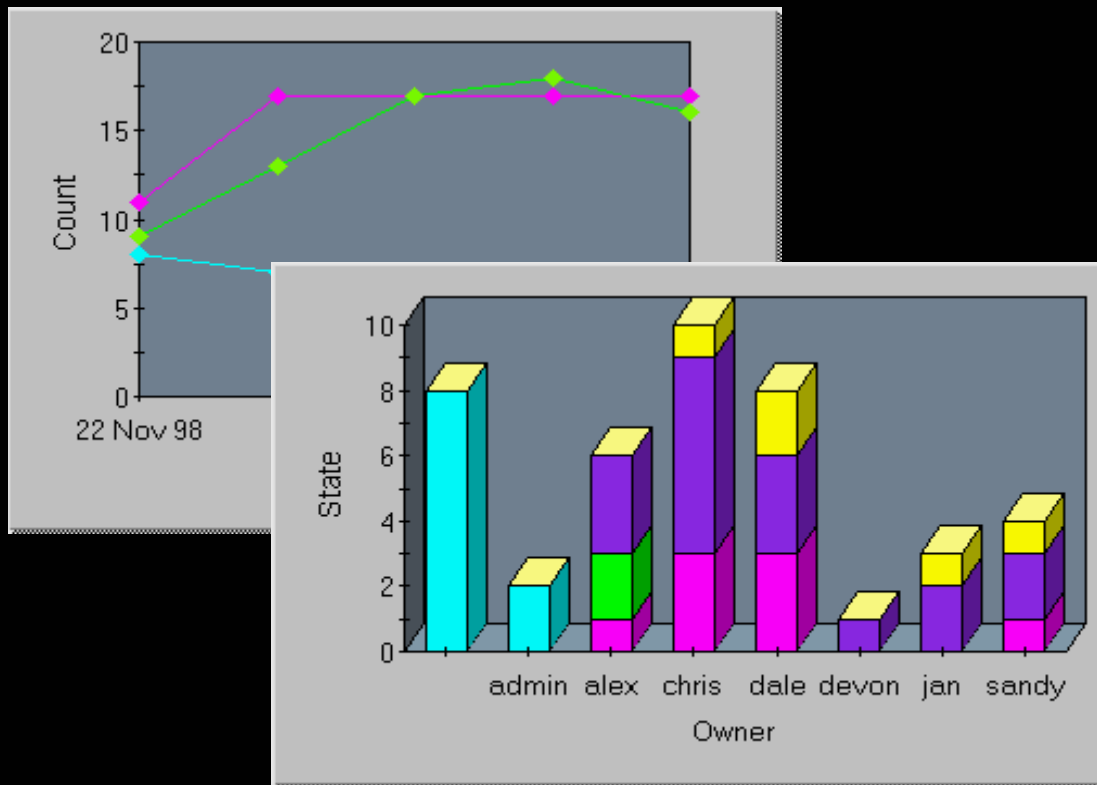
- ◆ Capture change requests
- ◆ Communicate real-time project status
- ◆ Control change at the "Activity" level
- ◆ Customize IBM Rational ClearQuest to meet your needs





# ClearQuest Tracks Project Status

- ◆ "Are all the high severity defects resolved in this build?"
- ◆ "What is the state of all iteration 1 enhancements?"



- ◆ Instant reporting delivers project status at any time
- ◆ Wizards quickly generate queries and charts
- ◆ Generate from Windows and/or Web interface
- ◆ Crystal Reports can be used for paper or web published reports



# Rational ClearQuest: *Windows & UNIX*

The screenshot displays the IBM Rational ClearQuest application interface. On the left, the 'ClearQuest Navigator' shows a tree view of user queries for 'alex,Classics@CLSIC' and 'pat,Classics@CLSIC'. The main window is titled 'ClearQuest Query Results' and shows a table of query results. Below the table, there are navigation controls for pages and records. At the bottom, the 'ClearQuest Record Details' window is open, showing fields for ID, State, Headline, Suite Project, Priority, and Owner, along with a description text area. A console window at the bottom left shows a successful login message.

Headline	id	Owner	State	record_type
Cash Register should automatically reorder stock	CLSIC00000030	alex	Assigned	EnhancementRequest
Request change due in larger font.	CLSIC00000027	alex	Opened	EnhancementRequest

ClearQuest Record Details (alex,Classics@CLSIC)

Main Analysis Customer Notes Resolution Attachments History Requirements ClearCase Unified Change Managem...

ID: CLSIC00000030 State: Assigned

Headline: Cash Register should automatically reorder stock

Suite Project: ClassicsPOS

Priority: Medium

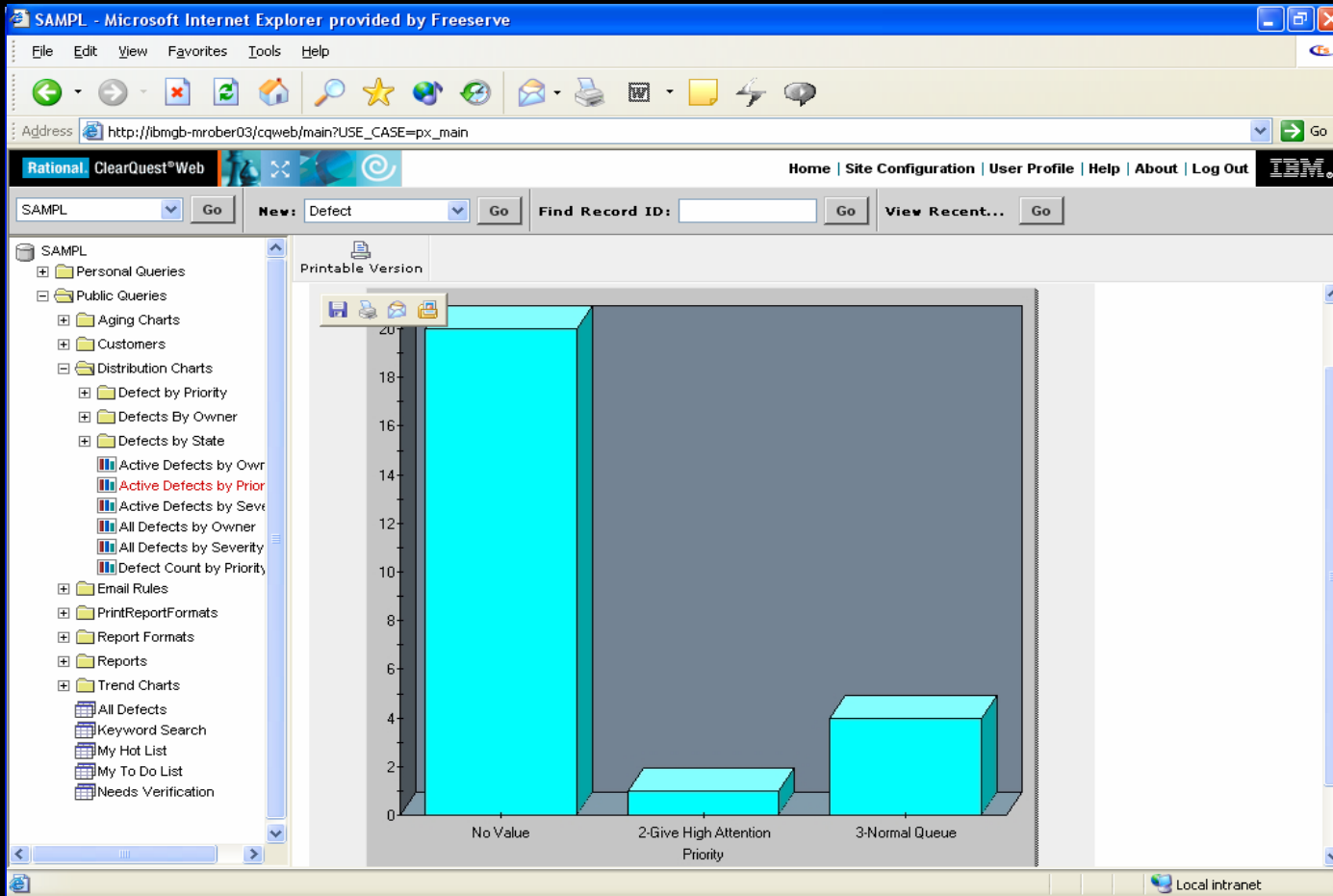
Owner: alex

Description: When a sale reduces the store's on-hand inventory of any CD title below the reorder level, the cash register should automatically submit an order to replenish that title.  
more text

Console: SQL Query : ClearQuest  
Thursday, March 31, 2005 12:46 PM  
Login Location: pat,Classics@CLSIC  
Successful!



# Rational ClearQuest: *Web*



Windows



UNIX



Web



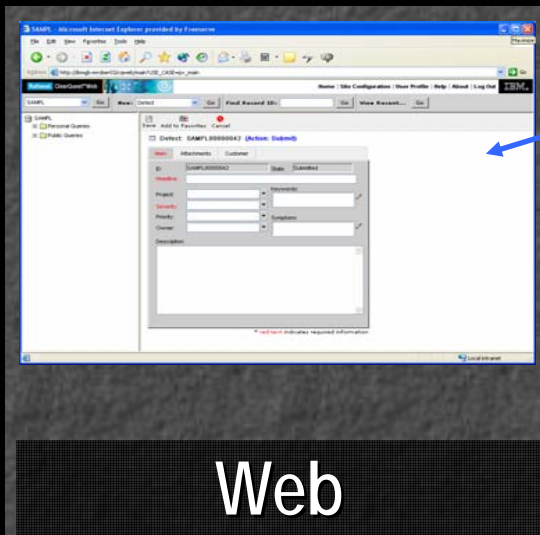
# Rational ClearQuest Deploys Anywhere

Design Once

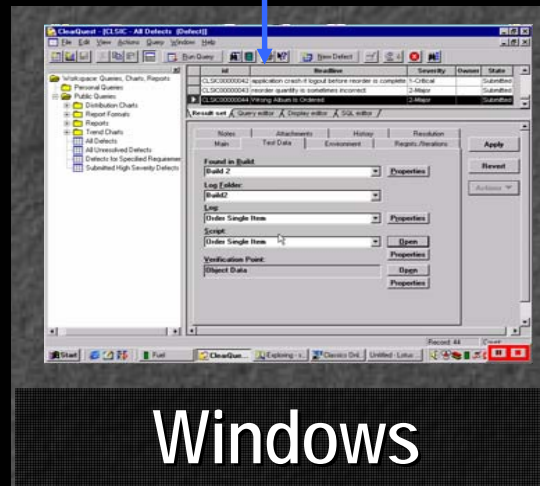


Deploys Anywhere

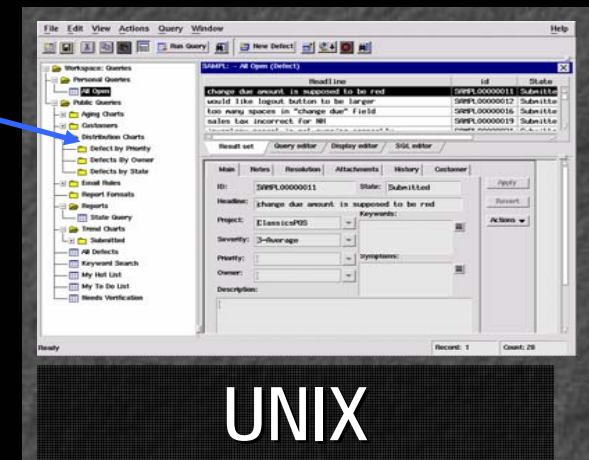
CQ Designer



Web



Windows



UNIX



# Rational ClearCase and ClearQuest

## Rational ClearQuest

Manages activities

- ◆ To Do Lists
- ◆ Workflow

## ClearQuest: Organized Activities

Request	Priority	Owner
Special Promo	1	Terry
Bug 527	2	Sandy
Add GUI button	2	Kim

## Rational ClearCase

Manages artifacts

- ◆ Versioning files
- ◆ Parallel development
- ◆ Security

## Change Set

Special Promo	
Spec123.doc	V5
Interface.c	V3
Data99.xml	V8

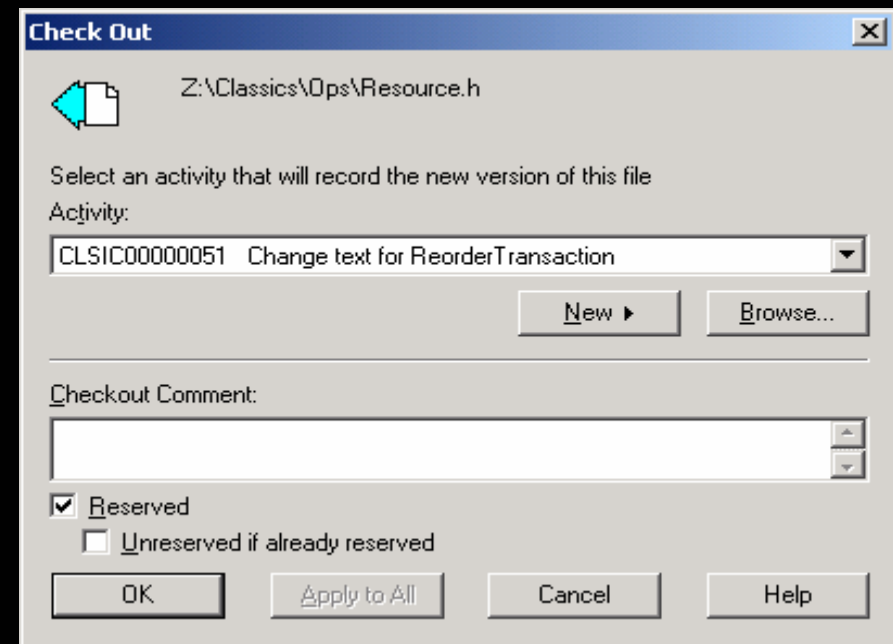
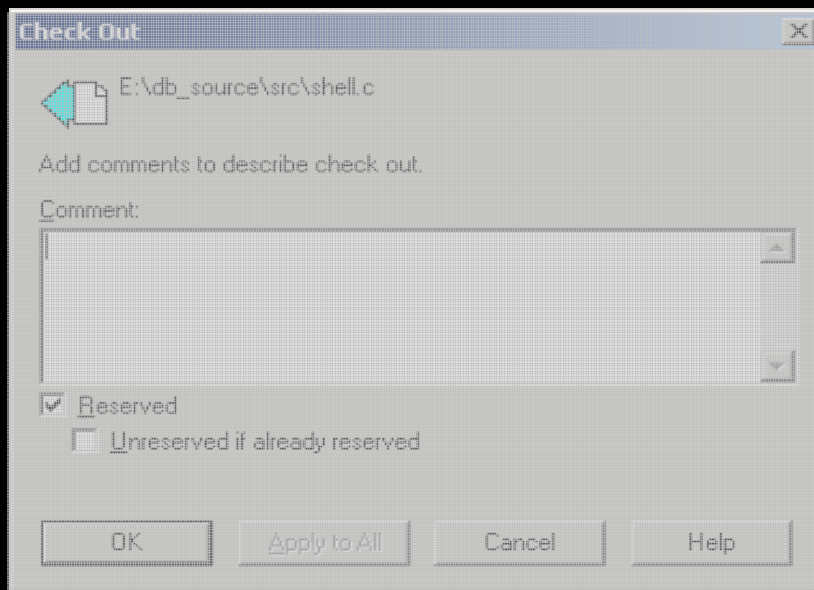


Unify activities and artifacts



# Associate Artefacts with Activities

- ◆ Each object checkout requires an associated activity
- ◆ Information is visible from file and from ClearQuest activity
- ◆ Search, query and report



# Visible from File and Activity

The screenshot shows the Rational ClearQuest application window titled "Rational ClearQuest - [CLSLIC : Rational Demo (MyToDoList (All\_Requests))]". The interface includes a menu bar (File, Edit, View, Actions, Query, Window, Help), a toolbar with icons for file operations and a "Run Query" button, and a "New Defect" dropdown menu. A table displays a list of defects:

Headline	id	State
Wrong error for incorrect password	CLSLIC00000092	Opened
inventory report is displaying an empty column	CLSLIC00000065	Assigned

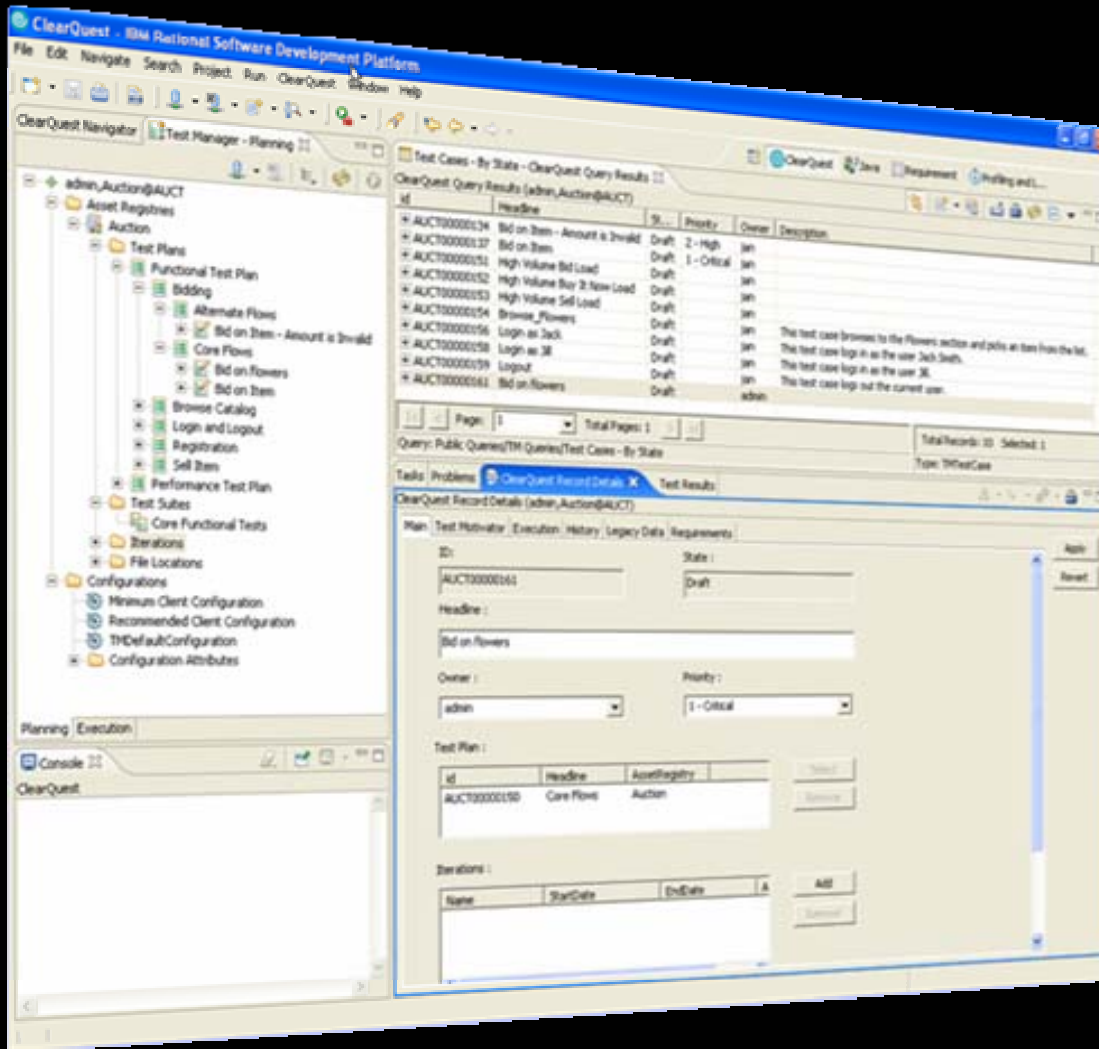
Below the table are tabs for "Result set", "Query editor", and "Display editor". The "Result set" tab is active, showing a "UCM Project" section with fields for "Rel3", "Stream: alex\_Rel3", and "View: alex\_Rel3". A "Change Set" section is also visible, listing files and their versions:

Name	Versions
\Classics\InvStat\vcpp\InvStat.cpp	1
\Classics\InvStat\vcpp\InvStat.odl	1
\Classics\InvStat\vcpp\InvStatInterface.cpp	2
\Classics\InvStat\vcpp\StdAfx.cpp	1
\Classics\InvStat\vcpp\warehouse.cpp	2

At the bottom of the main window, there is a status bar with "ID : 00000092". A "Change Set" dialog box is overlaid on the bottom right, displaying the same file and version information as the table above.



# Test Management with ClearQuest



## ◆ Eclipse Based Test Management

- Joins Functional and Performance Tester to complete transition of testing tools to eclipse platform

## ◆ Key Functional Areas

### ■ Test Planning

- Create test plans, test cases and configure test cases

### ■ Test Execution

- Create suites or run individual test cases

### ■ Test Reporting

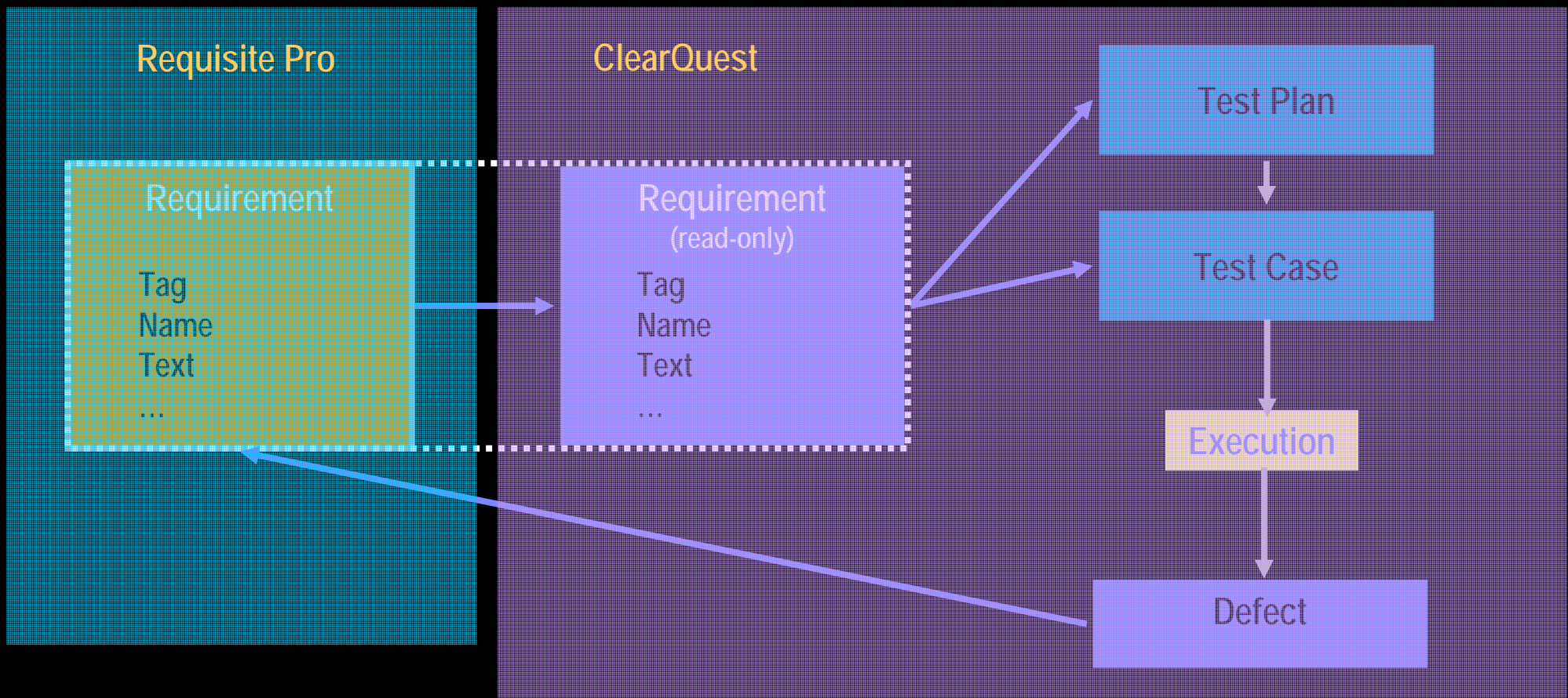
- Extensive query and reporting facilities to measure test progress





# ClearQuest & Requisite Pro Information Flow

- ◆ Distributed test planning, execution and analysis



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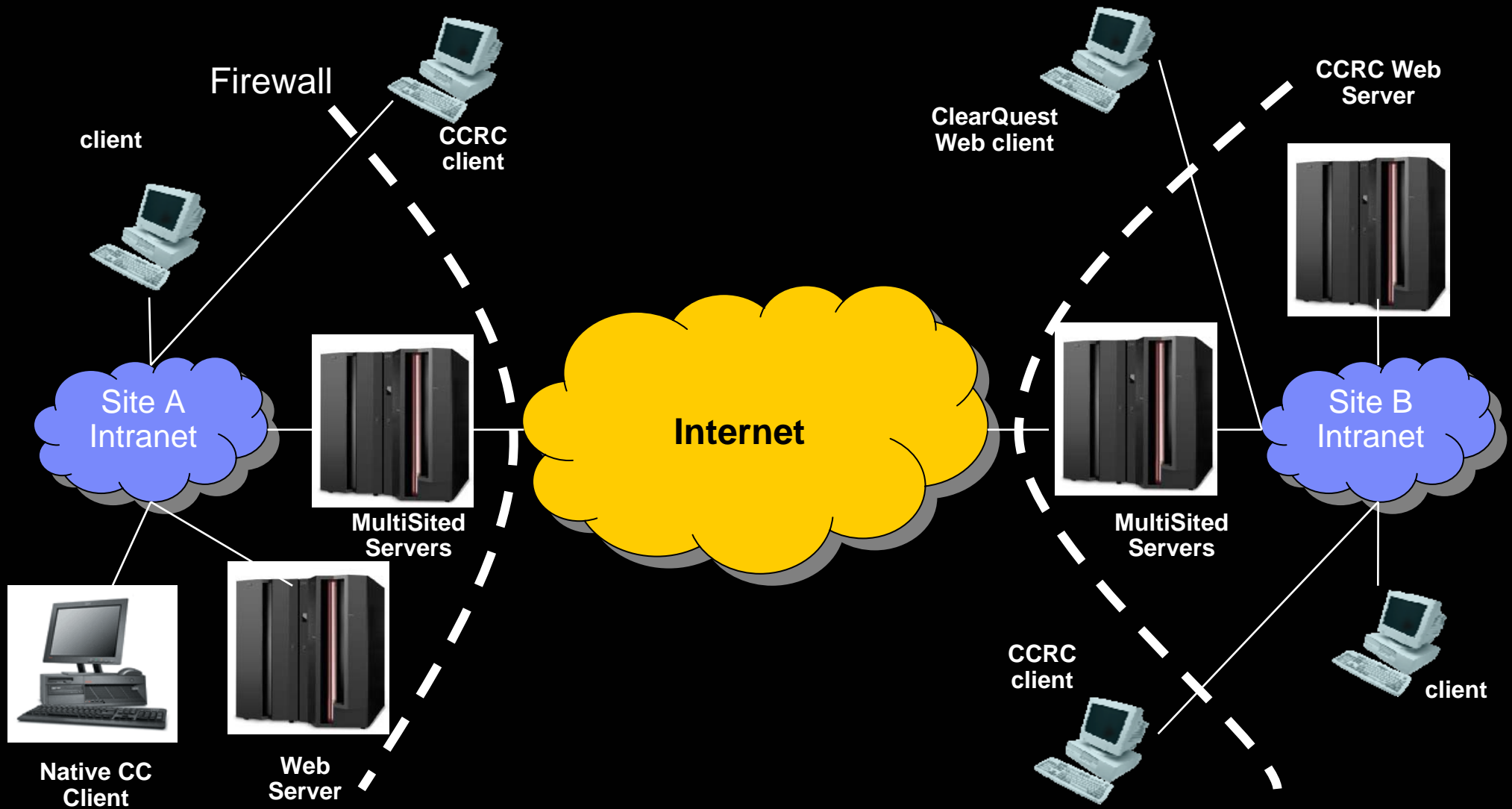


## ClearCase and ClearQuest MultiSite

- ◆ Layered product on ClearCase or ClearQuest
- ◆ Replicates ClearCase or ClearQuest repositories
- ◆ Synchronizes replicas automatically
- ◆ Supports parallel software development
  - Identical process at each site
- ◆ Supports software reuse across geographically distributed project teams
- ◆ Interoperation solution in a mixed UNIX and Windows network



# Example Customer Deployment with MultiSite



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# Build & Release Challenges

## Current Conditions

- ◆ Manual, error-prone build processes
- ◆ Proprietary internally-developed systems
- ◆ Inconsistent processes across products and platforms
- ◆ Dependence on build staff to execute, troubleshoot, and provide feedback
- ◆ Inconsistency between developer environments and production systems
- ◆ Time consuming to detect and resolve problems
- ◆ Lack of traceability and compliance readiness

## Business Impact

- ◆ Unpredictable product release cycles
- ◆ Costly systems to support & maintain with knowledge held by a few
- ◆ Limited repeatability or portability for new projects and platforms
- ◆ Staff burden, delays, lost productivity,
- ◆ Unforeseen errors surface later in the release cycle
- ◆ More people required to do more work
- ◆ Extensive ad hoc effort spent in audit preparation

***“Software build management increasingly impacts successful software deployments, business and IT productivity and is becoming a focus for IT organizations.” - IDC***



# System Overview

## BUILD/RELEASE FRAMEWORK

### Management Console

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

### IDE Plug-Ins

Developer Self-Service, Role-Based Security

Workflow

Control

Acceleration

Notification

Scheduling

Log Analysis

Tracking

Reporting

### Process Automation

Automated, Repeatable Application Development Lifecycle

Development

Source Control

Product Build

Quality Assurance

Package

Release

#### Scripting

Python, VBscript, Batch, Perl, KSH

#### IDEs

- RAD
- Eclipse
- Visual .NET

#### Languages

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

#### Source Control

- ClearCase

#### Change Mgmt

- ClearQuest

#### Build Tools

- ClearMake
- Ant
- NAnt
- Make
- GNUMake
- NMake
- Open Source
- etc.

#### Test Tools

- TestManager
- Performance
- Functional
- Robot

#### Release Tools

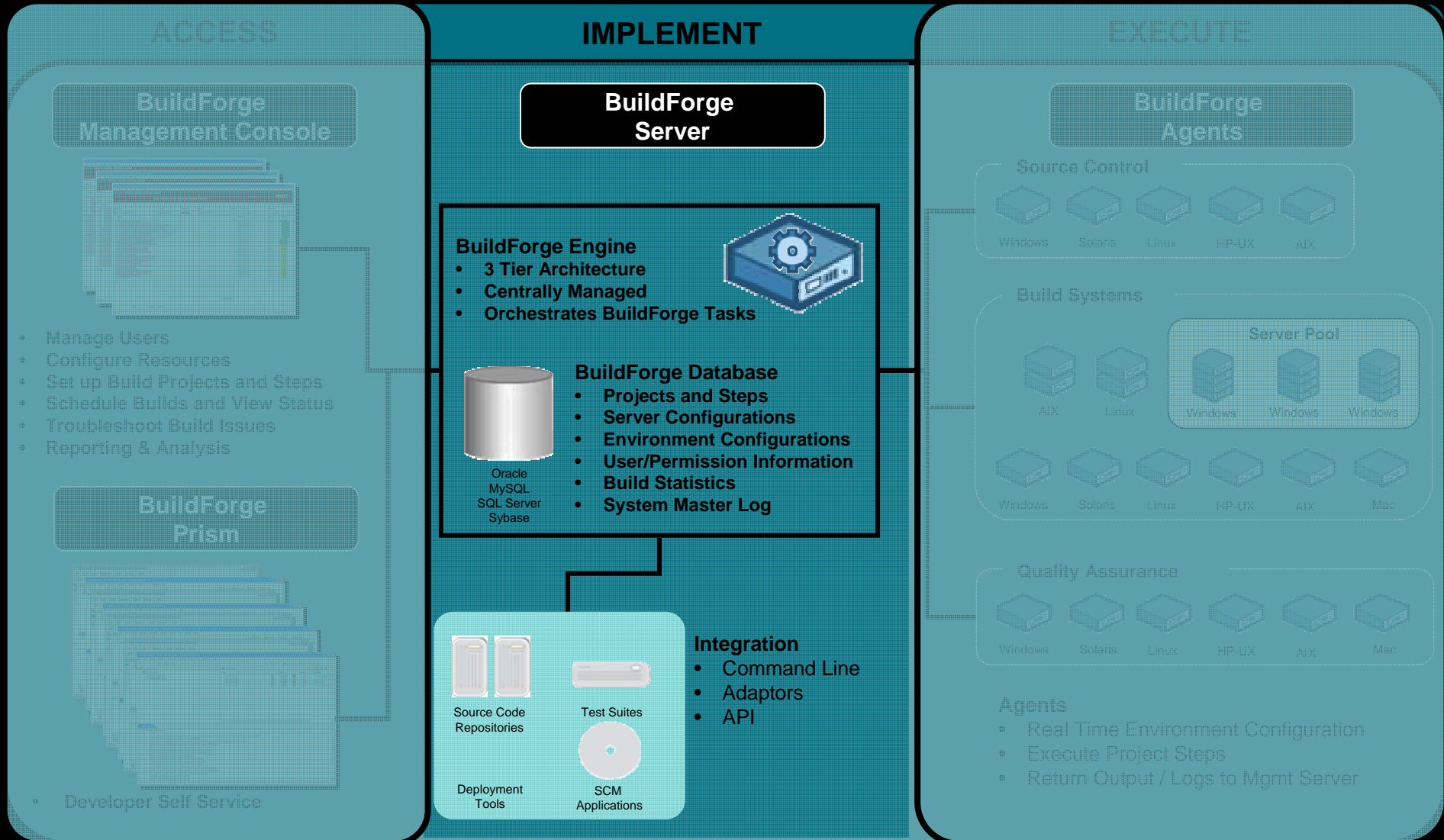
- Tivoli
- WebSphere

#### Platforms

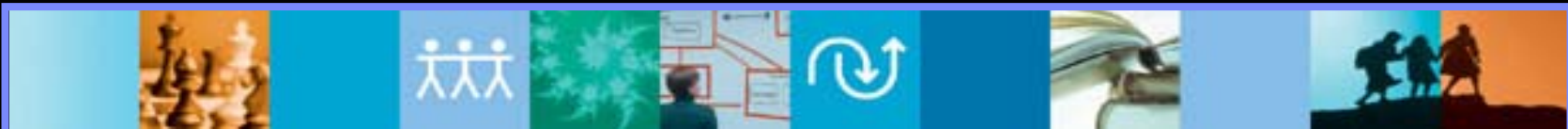
UNIX, Windows Mac, Linux, Proprietary



# Functional Architecture







# Thank You

*Mark Roberts*

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