Change and Configuration Management
IBM Software Development Platform

Segrate, 22 Novembre 2006

IBM. Rational. software

Agenda

- Defining Change and Configuration management
- Business value of Change and Configuration management solutions
- Challenges-solutions in Change and Configuration management
- Capabilities of Rational Change and Configuration management tools
- BuildForge Demo
- ECM Demo
- Closing, Q&A and Thanks

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Defining Change and Configuration Management

- The control and adaptation of the evolution of complex systems. It is the discipline of keeping evolving software products under control, and thus contributes to satisfying quality and time constraints. Software configuration management (or SCM) can be divided into two areas:
  - The first area of SCM concerns the storage of the entities produced during the software development project
  - The second area concerns the activities performed for the production and/or change of these entities

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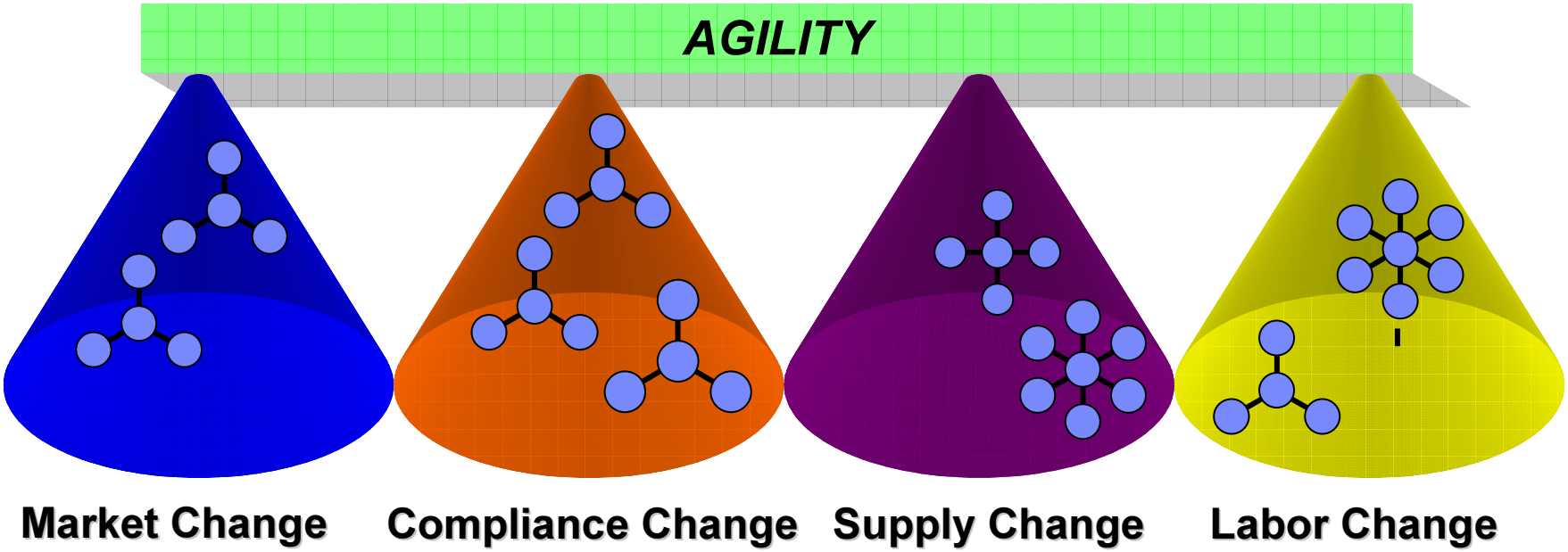
Why Change and Configuration Management ?

Software projects are more complex than ever

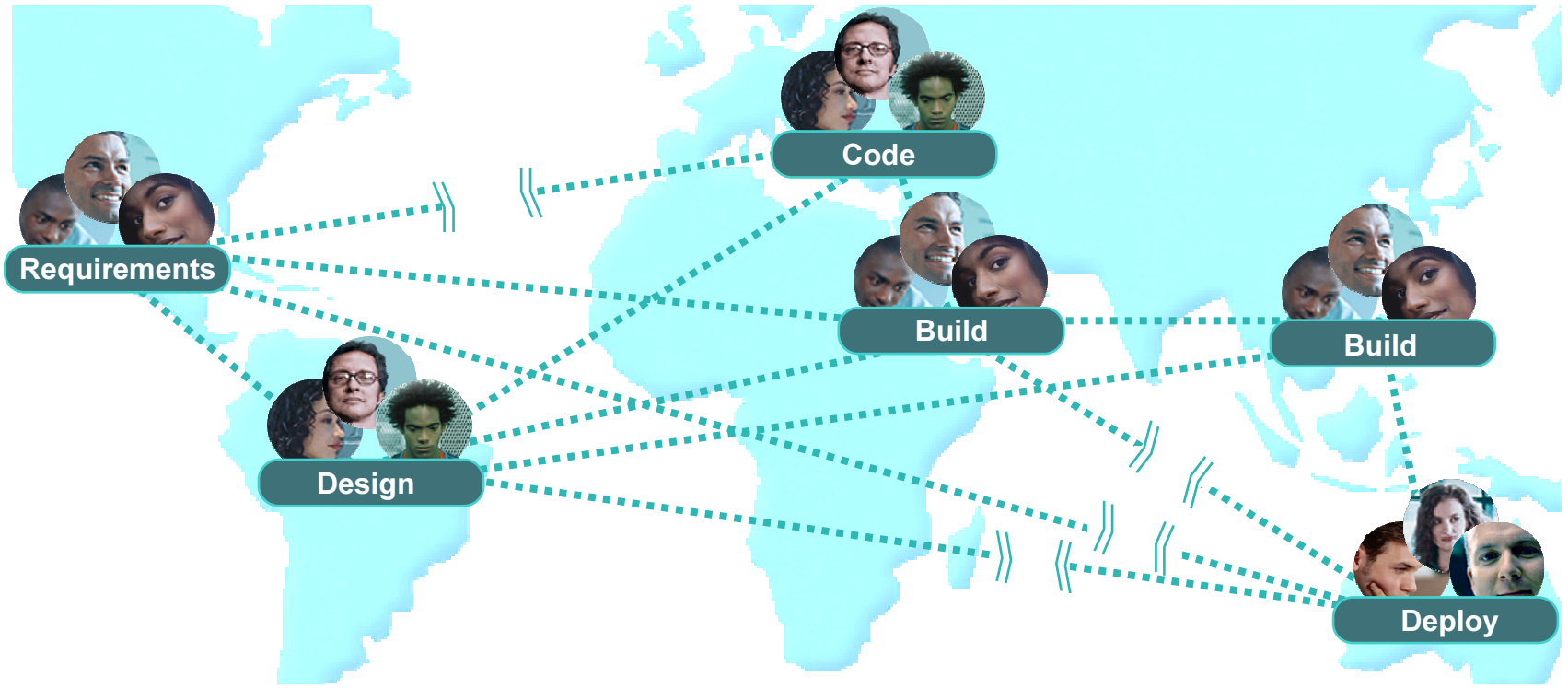
- Many developers
- Complex software and content artifacts
  - source code
  - object code
  - web content
  - test scripts
  - DB tables structure
  - documentation
  - models and designs
  - requirements
  - directories
  - DB tables data
- Larger and distributed teams
- Changing business needs
  - mergers, acquisitions, OEM
- Change in Internet time
- Many releases and platforms (heterogeneous environment)
- Many locations where software is developed

Quality Change and Configuration Management improves responsiveness and agility



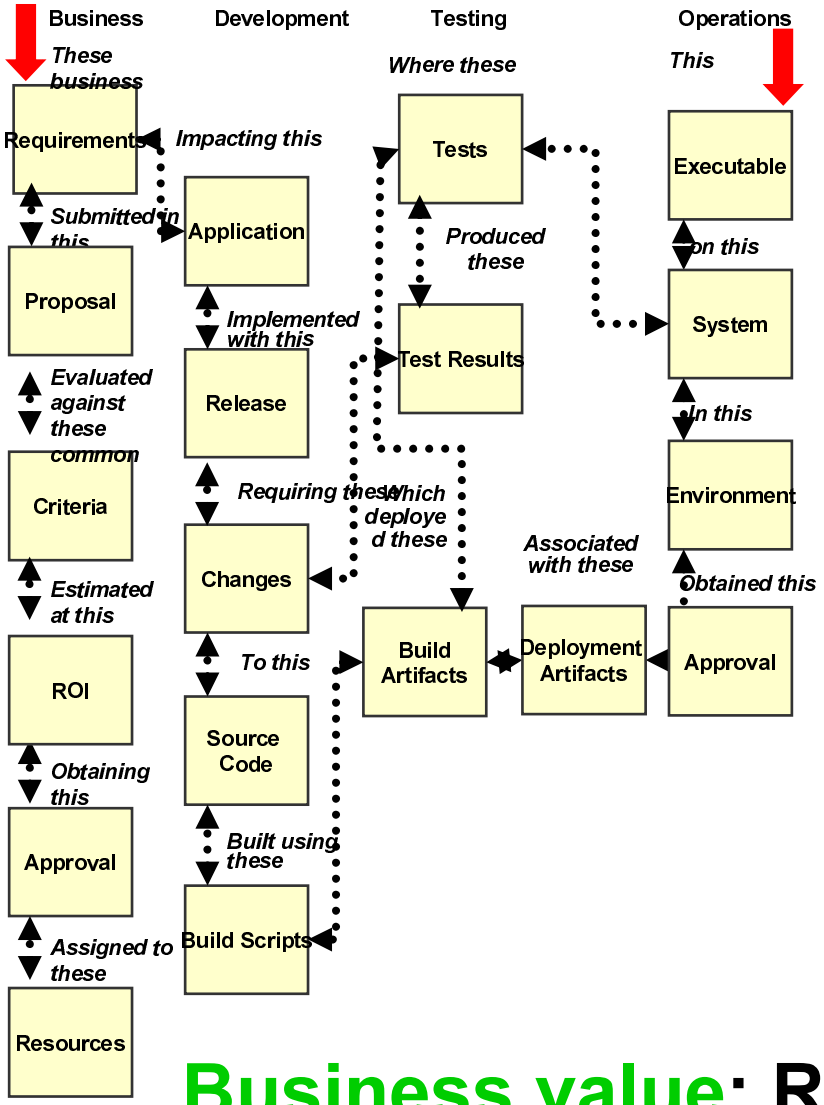
Business value: Cope with changing business needs and pressures

Improves management of distributed development



Business value: Collaboration and reuse reduces cost

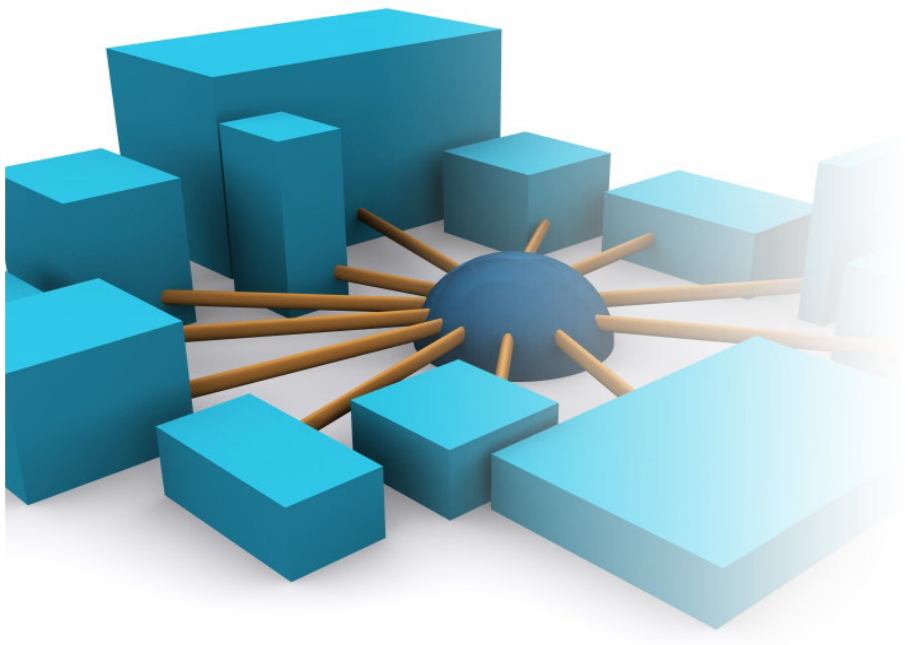
Makes compliance easier



- Help enforce a secure and audit-ready development environment
- Establish end to end life cycle traceability

Business value: Reduce risk of Failing Audits

Get better visibility into projects



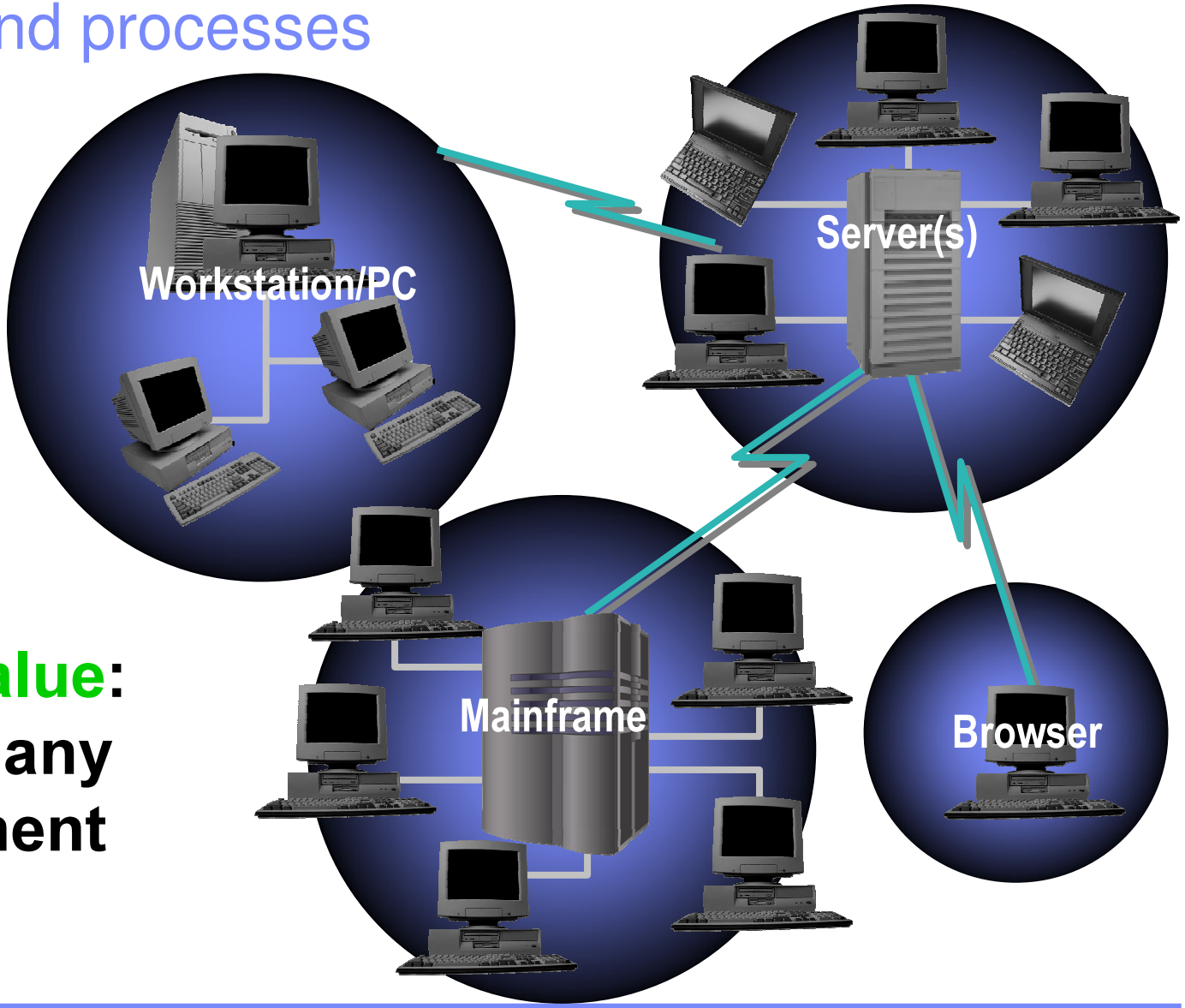
Instant Insight into Projects

Test **Change** **Defects**

- Single project view
- Global test project coordination
- Configurable, enforceable processes

Business value: better control and predictability

Improve Management of complex architectures, environments and processes



Business value:
Works in any environment

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The challenge: poor visibility, lack of cohesion across business and technology domains

Business View

- Poor visibility and governance over IT investments
- Lack of actionable information
- Blind decision-making

Operations View

- Inadequate service levels
- Inability to rapidly deploy applications
- Complex, multi-tier operating environments

Application Development View

- Overwhelming complexity
- Relentless time-to-market pressure
- Uncontrolled change

Solutions must add value across all levels of business

Executive

- Managing change effectively speeds the development lifecycle
- Metrics ensure efficient resource allocation
- Integrations streamline cross-functional team communication

Maximize
business results

Project Manager

- Instant project status updates pinpoint problem areas quickly
- Effective bug triage meetings improve quality
- Automated workflow keeps the team in synch

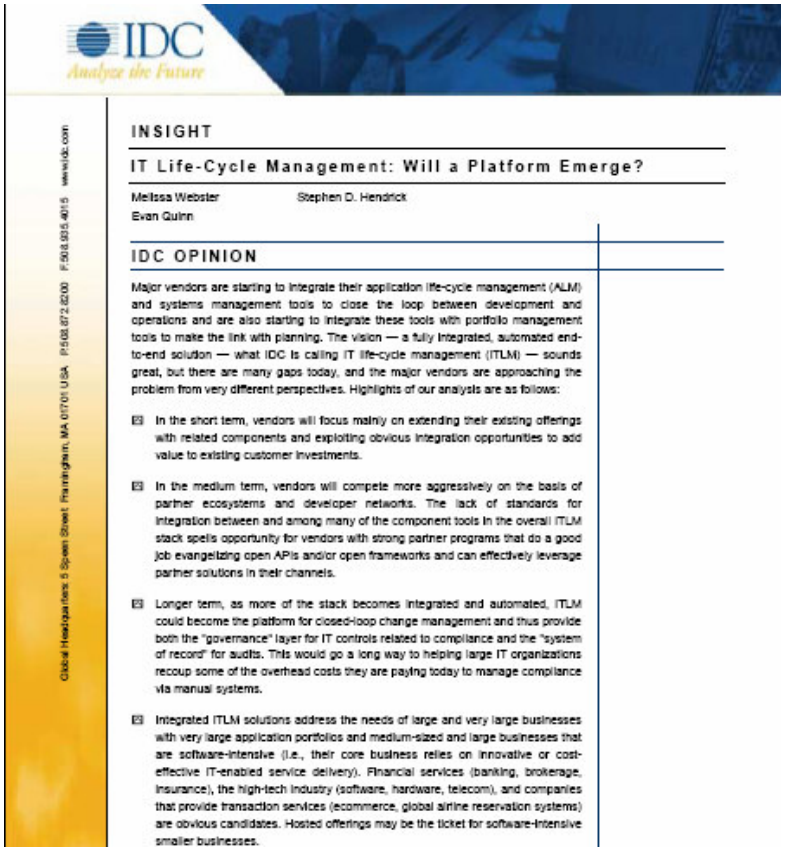
Ensure
predictable results

Practitioner

- Easy submission and modification of change requests saves me time
- Personal metrics tell me what I should work on first
- Automation of tedious tasks saves me time

Frees
me to focus

IT Lifecycle Management … bridging the Gap



IDC
Analyze the Future

Global Headquarters: 5 Speen Street, Framingham, MA 01701 USA P.508.872.8200 F.508.935.4015 www.idc.com

INSIGHT

IT Life-Cycle Management: Will a Platform Emerge?

Melissa Webster Stephen D. Hendrick
Evan Quinn

IDC OPINION

Major vendors are starting to integrate their application life-cycle management (ALM) and systems management tools to close the loop between development and operations and are also starting to integrate these tools with portfolio management tools to make the link with planning. The vision — a fully integrated, automated end-to-end solution — what IDC is calling IT life-cycle management (ITLM) — sounds great, but there are many gaps today, and the major vendors are approaching the problem from very different perspectives. Highlights of our analysis are as follows:

- In the short term, vendors will focus mainly on extending their existing offerings with related components and exploiting obvious integration opportunities to add value to existing customer investments.
- In the medium term, vendors will compete more aggressively on the basis of partner ecosystems and developer networks. The lack of standards for integration between and among many of the component tools in the overall ITLM stack spells opportunity for vendors with strong partner programs that do a good job evangelizing open APIs and/or open frameworks and can effectively leverage partner solutions in their channels.
- Longer term, as more of the stack becomes integrated and automated, ITLM could become the platform for closed-loop change management and thus provide both the "governance" layer for IT controls related to compliance and the "system of record" for audits. This would go a long way to helping large IT organizations recoup some of the overhead costs they are paying today to manage compliance via manual systems.
- Integrated ITLM solutions address the needs of large and very large businesses with very large application portfolios and medium-sized and large businesses that are software-intensive (i.e., their core business relies on innovative or cost-effective IT-enabled service delivery). Financial services (banking, brokerage, insurance), the high-tech industry (software, hardware, telecom), and companies that provide transaction services (ecommerce, global airline reservation systems) are obvious candidates. Hosted offerings may be the ticket for software-intensive smaller businesses.

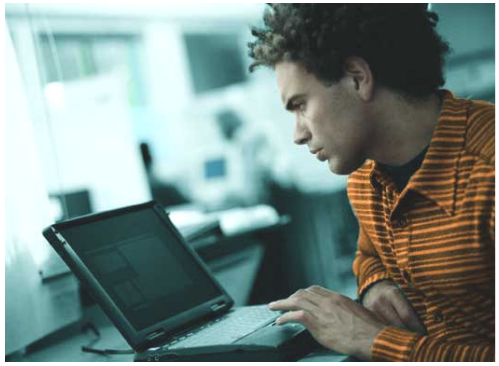
"Major vendors are starting to integrate their application life-cycle management (ALM) and systems management tools to close the loop between development and operations and are also starting to integrate these tools with portfolio management tools to make the link with planning. The vision – a fully integrated, automated end-to-end solution – what IDC is calling IT life-cycle management (ITLM)…"

Melissa Webster, IDC, May 2005 - "IT Life-Cycle Management: Will a Platform Emerge?"

Challenge #1
Sluggish response to business change

- Slow response to changing requirements causing diminished development investment returns
- Poor metrics and reporting capabilities causing inefficient workload distribution
- Use of non-value-added processes
- Disjointed development and deployment efforts resulting in extra cycles and slowed delivery

Solution #1
Improving responsiveness and agility



- Allow your developers to work independently but still coordinate their work as a team
- Get better visibility into your projects status and deliverable's states
- Have developers automatically merge their changes into multiple projects running simultaneously
- Know precisely which change requests and/or defect fixes were incorporated into each build
- Easily track change requests to requirements to test results to build and release artifacts

Challenge #2
Poor individual and team effectiveness


Deployment Manager


Developer


Architect


Tester

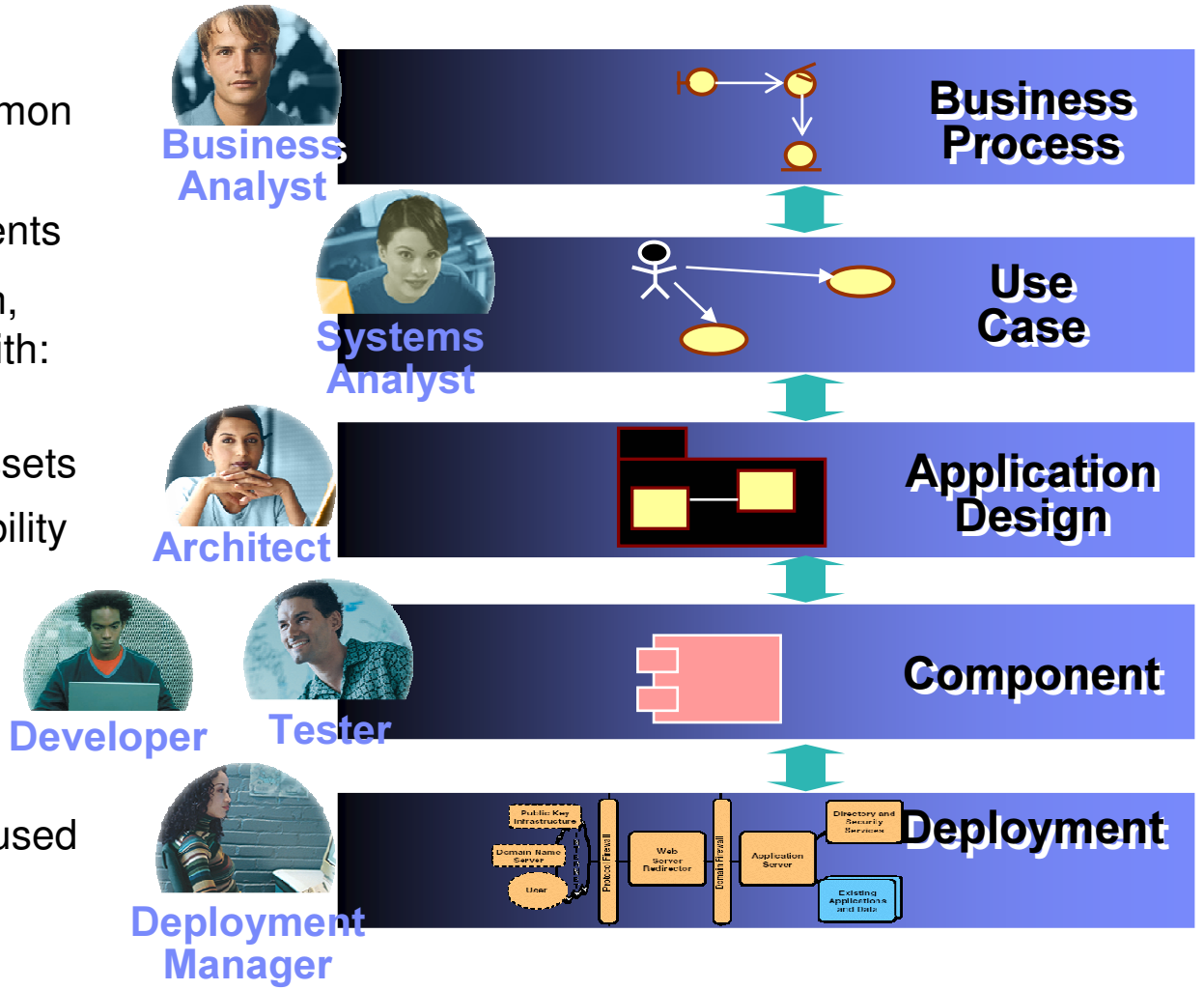

Business Analyst


Systems Analyst

- Slow and lacking communication
- Lack of reused components
- Manual processes
- Limited of collaboration

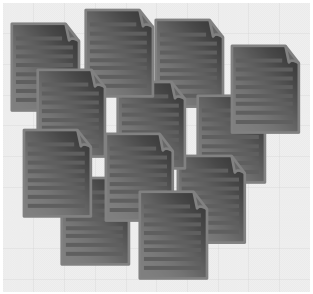
Solution #2
Improving individual and team effectiveness

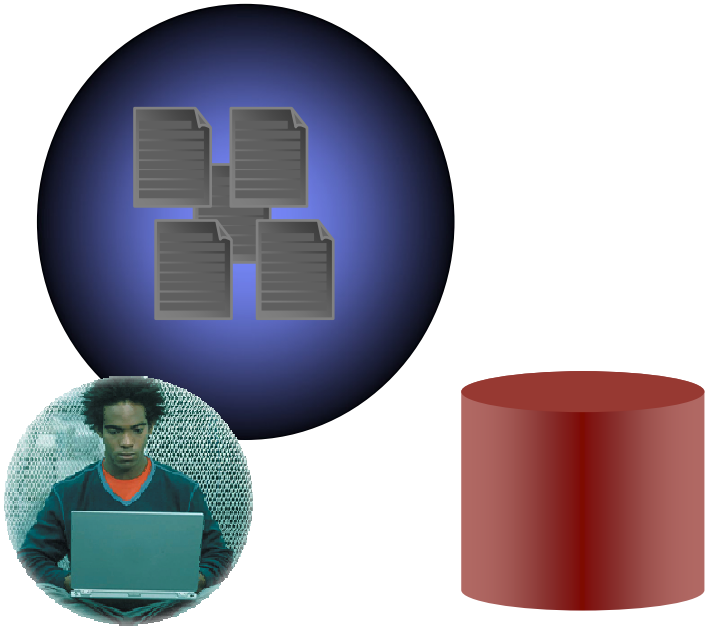
- Multiple perspectives of common data, optimized for each role
- Remote access and Web clients
- Better project communication, collaboration, coordination with:
  - a central repository for all development and build assets
  - built in automation with ability to add custom script
- Automate and control the software life cycle
- Parallel development
- Support for most commonly used IDE's

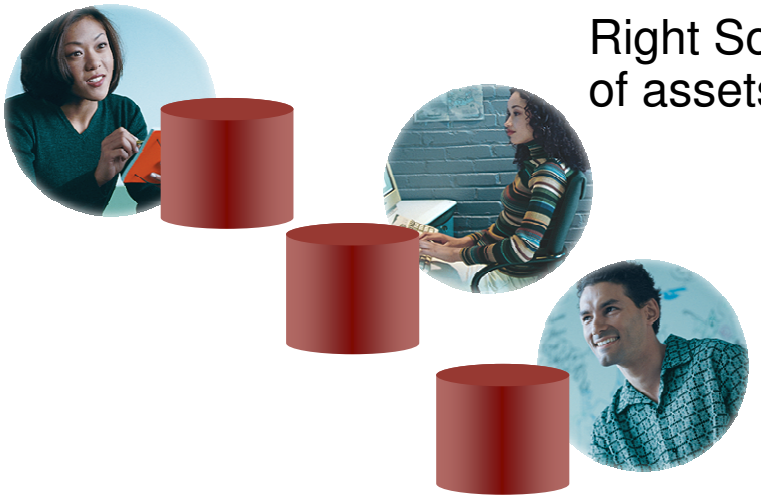


Challenge #3
Inability to properly manage enterprise wide distributed resources

Scattered Local and Remote Resources



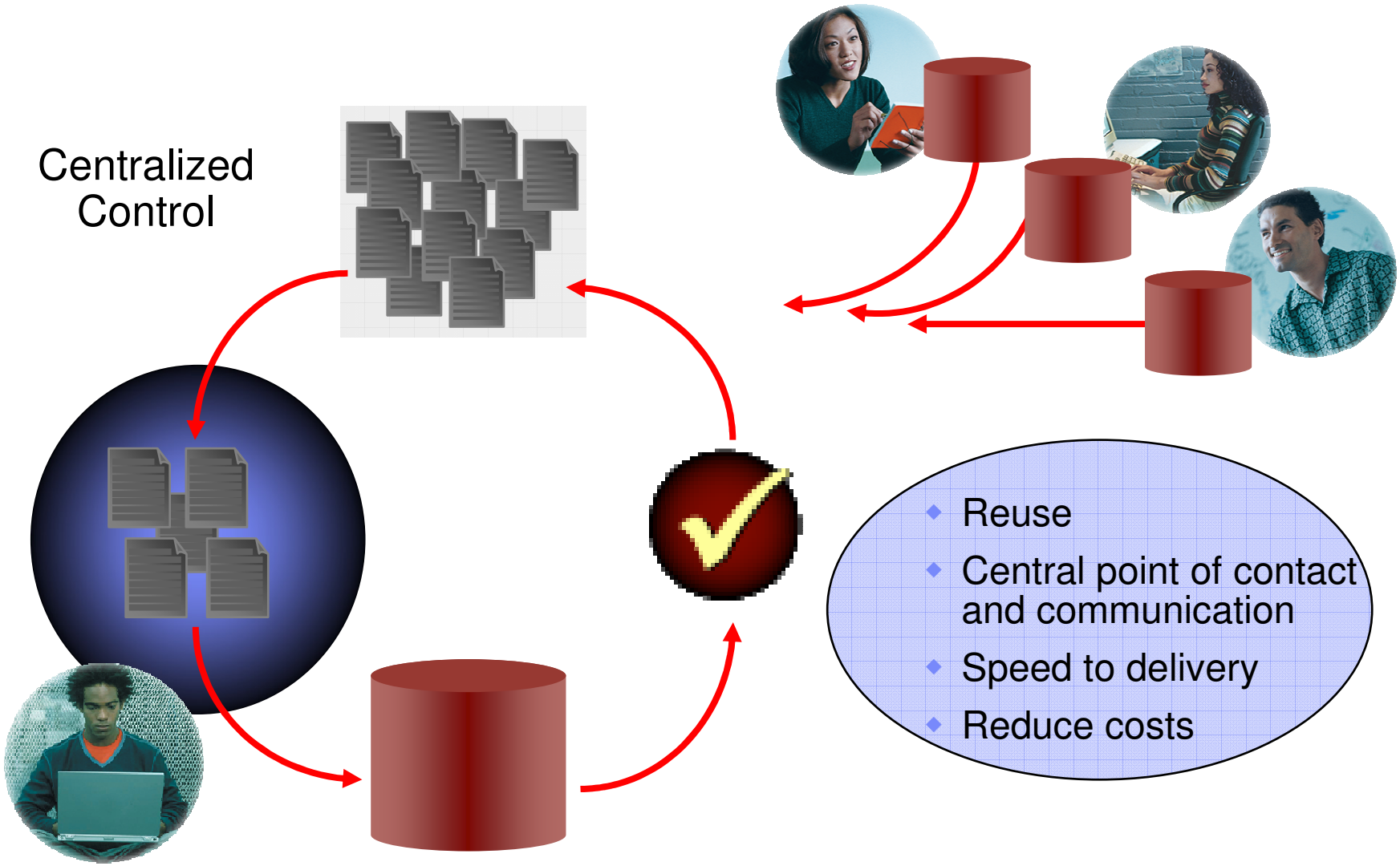




Right Sourcing of assets

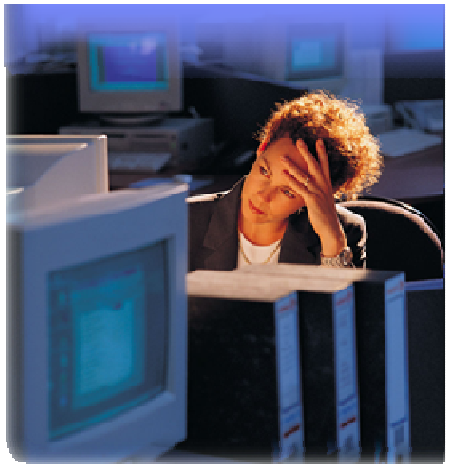
- Reproduction
- Gaps in communication
- Time lost in progress

Solution # 3
Streamlined management of distributed resources



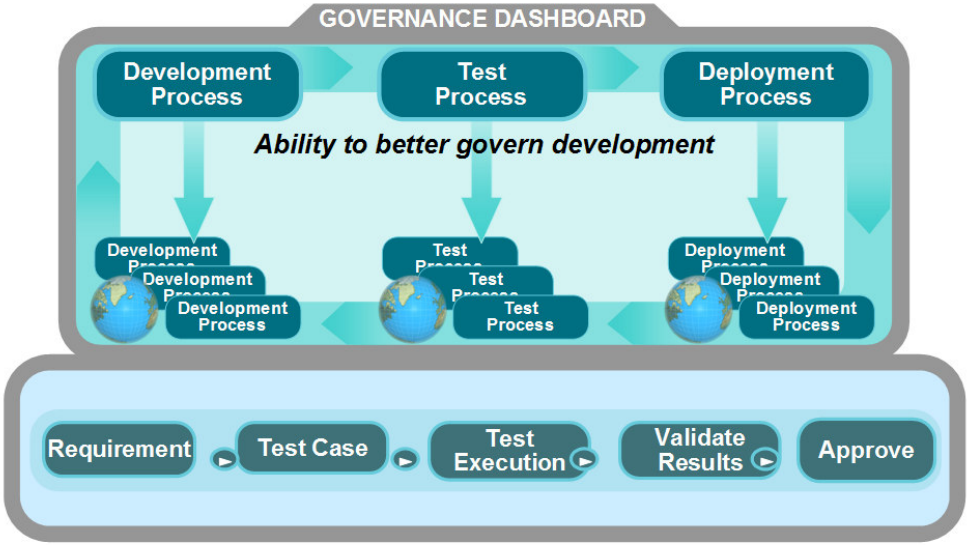
Challenge #4
Compliance

- Regulations and standards
  - Government agencies need to comply with OMB A-123 (equivalent SoX 404 in the Commercial Sector) and (FISMA) Federal Information Security Management Act.
  - Healthcare compliance issues include FDA 21 CFR Part 11, HIPPA (Health Insurance Accountability and Portability Act), and Sarbanes Oxley.
  - Standards such as CMMI are widely adopted by public and finance customers to facilitate process improvement and compliance efforts.



Solution #4
Improving control and traceability

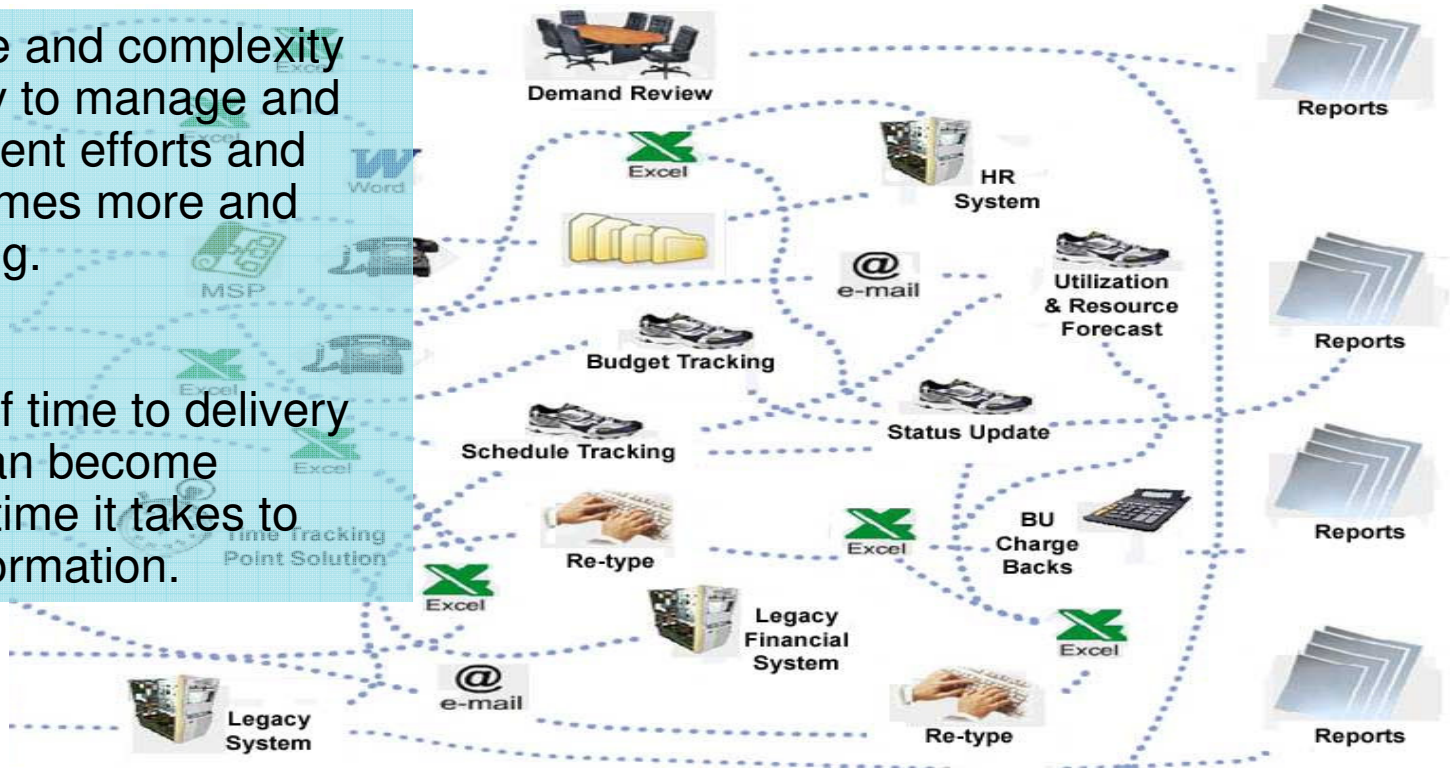
- Management required change approvals
- Automatic Change Logging
- Metadata accompanied change request that assists in determining impact analysis
- Document all changes introduced into the environment from inception to delivery
- Password security
- Audit trails
- Electronic signatures



Challenge #5
Poor visibility into project's progress and status

- As project size and complexity grows the ability to manage and focus development efforts and resources becomes more and more challenging.

- Assessment of time to delivery and progress can become obsolete in the time it takes to compile this information.

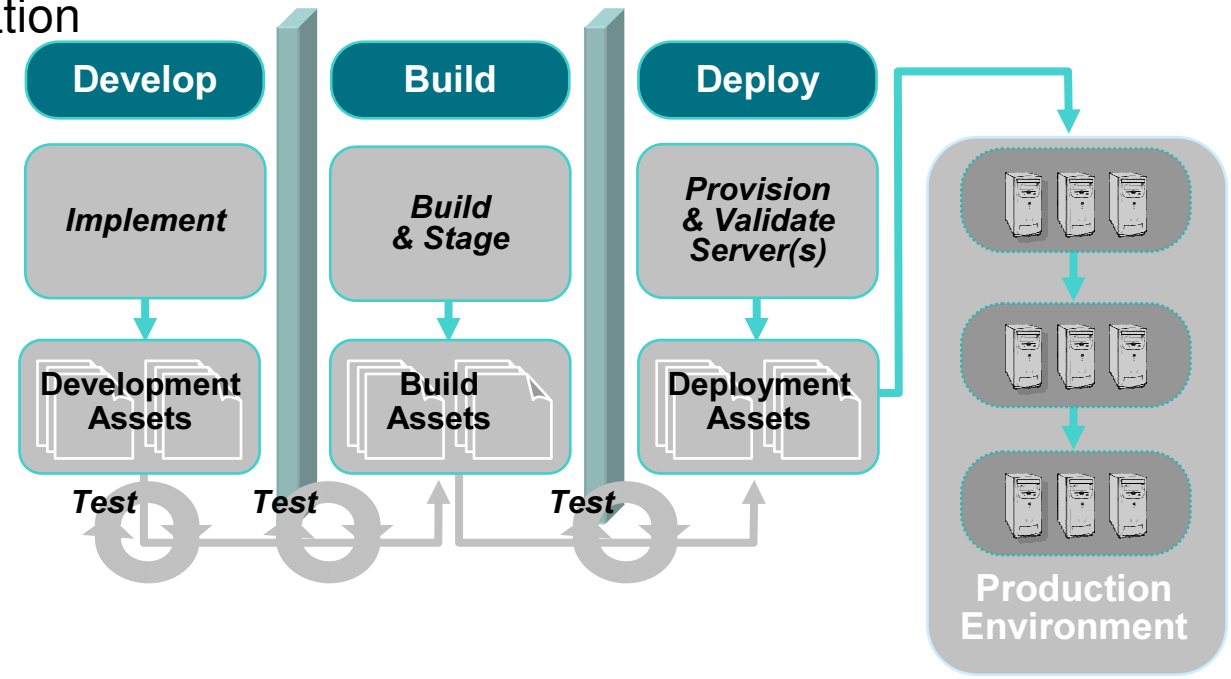


Solution #5
Real-time project status

- Queries & Charts
  - Easily create and modify with Wizards
  - Charts: Aging, Trend, Distribution
- Reports
  - Crystal Reports-based run-time engine
  - Export to many common formats (Excel, Word, HTML)
- E-mail notification rules
  - Automatic notification of events and state changes
  - Configurable through GUI interface
  - Out of the box configuration

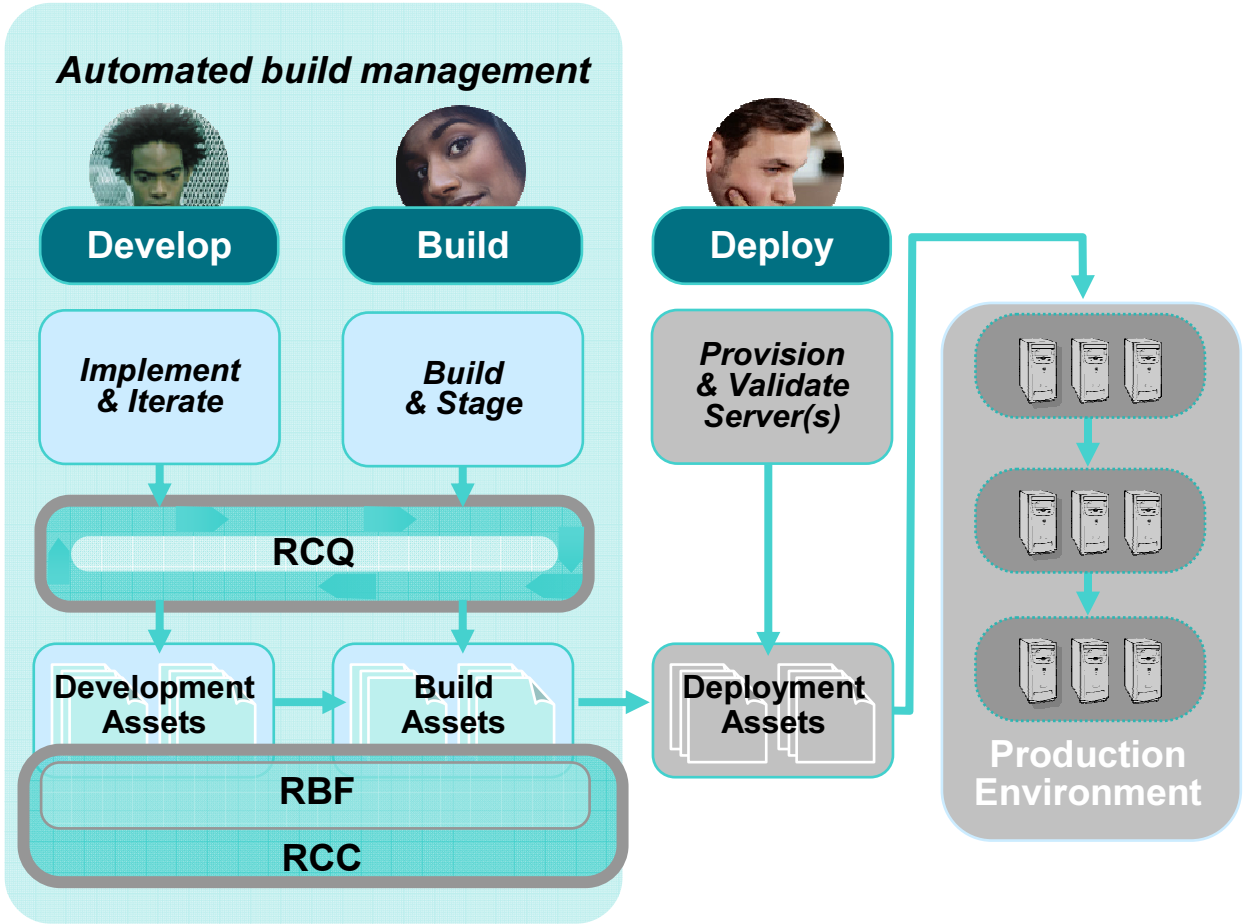
Challenge #6: Complex development, test, build and deployment architectures

- Difficulty tracking testing status of multiple builds
- No shared processes, artifacts or controls
- "Over the wall" communication
- Minimal reuse
- Labor intensive
- Error prone handoffs



Solution #6: Automated build management

- Automated build management
- Detailed record of build content
- Support for continuous builds
- Build records for tracking and reporting



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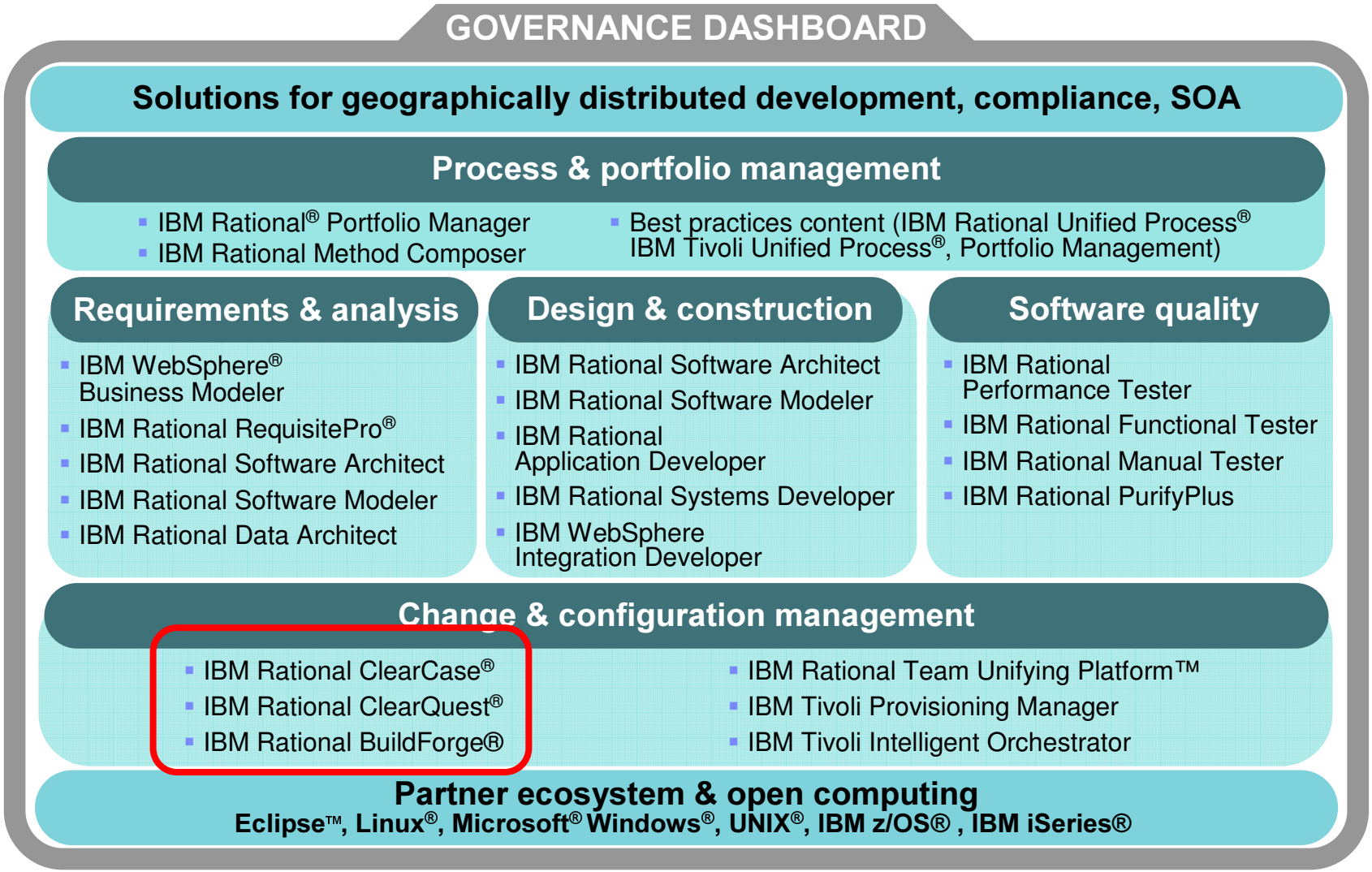
All Part of the IBM Rational Software Development Platform



IBM Software Configuration management offerings

Benefits

- Quickly respond to change
- Develop anytime, anywhere
- Ensure predictable results
- Promote and support reuse

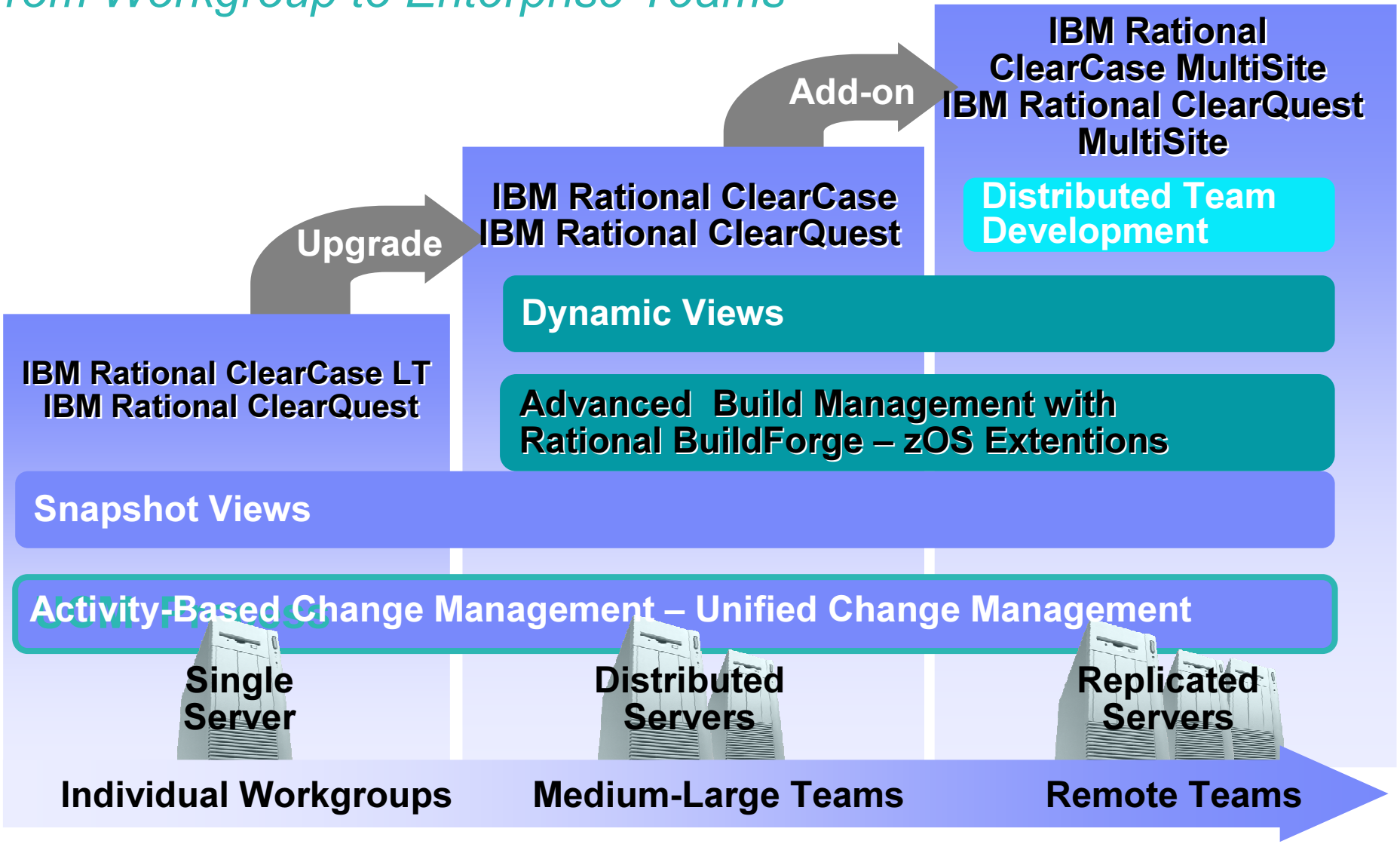
Capabilities

- Change and asset management
- Build and release management
- Flexible workflow support
- Traceability across the lifecycle

Key Products	Project Manager	Developer	Tester	Analyst
IBM Rational ClearCase	✓	✓	✓	
IBM Rational ClearQuest	✓	✓	✓	✓
IBM Rational BuildForge	✓	✓	✓	
IBM Rational Team Unifying Platform	✓	✓	✓	✓
IBM z/OS SCLM Suite		✓		

IBM Rational Change Management

From Workgroup to Enterprise Teams



IBM Rational **ClearQuest**
Primary benefits

- Single project view with end to end lifecycle record request tracking
  - Defects
  - Enhancement Requests
  - Customer defined records

- Test management Asset Management
  - Create and configure test plans and test cases
  - Create and run suites or individual test cases
  - Extensive query and reporting facilities to measure test progress

- Activity management
  - Built-in work flow management
  - Integrated asset management with Rational and 3rd party tools
  - Definable, repeatable and auditable processes

Rational ClearQuest provides better visibility into enterprise wide management with a Single project view abilities

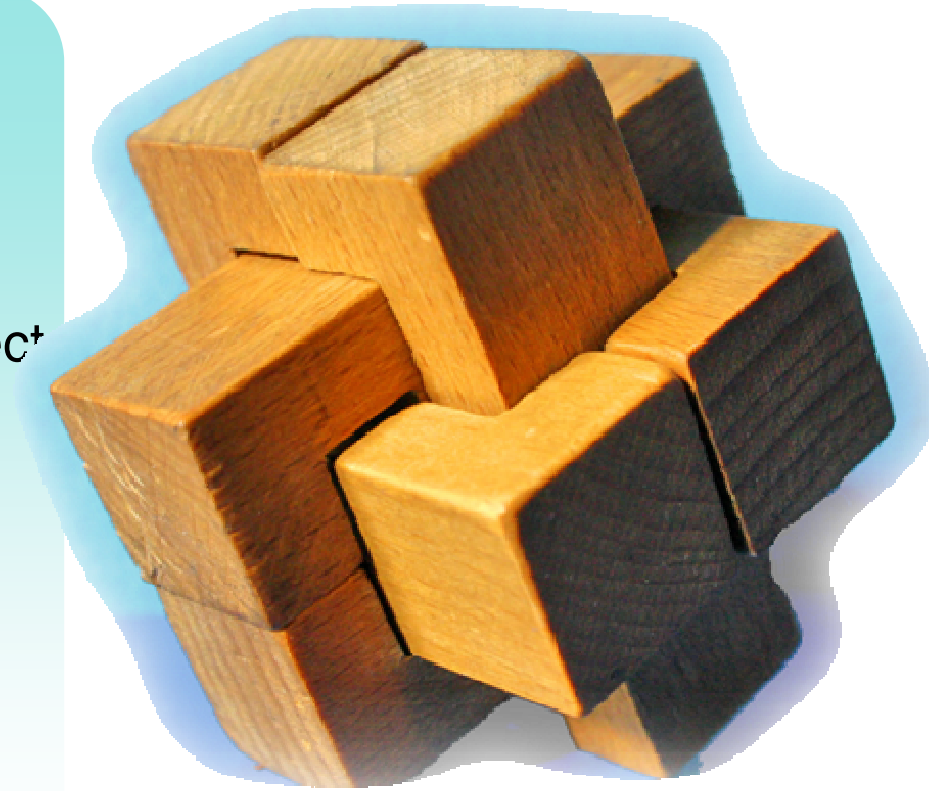
- Resource allocation
  - “Are change requests distributed evenly across the team?”
  - “Who is available to take on a mission-critical bug fix?”
- Project status
  - “How many Priority 1 defects are still outstanding?”
- Trends
  - “How long is it taking to fix the average bug?”
  - “How long is taking to implement enhancement requests?”
- Testing
  - “How many defects are in the verifying state?”

IBM Rational ClearQuest-- Single Project View

Single solution to manage tests, defects and project change

Benefits:

- Consolidated, real-time view of the entire project status
- Traceable, auditable relationships between development, test and project artifacts
  - Manages test planning, test results, quality metrics, and defects
  - Central repository with integrated version control
  - Comprehensive quality metrics in project dashboards and reports



Communicate real-time project status

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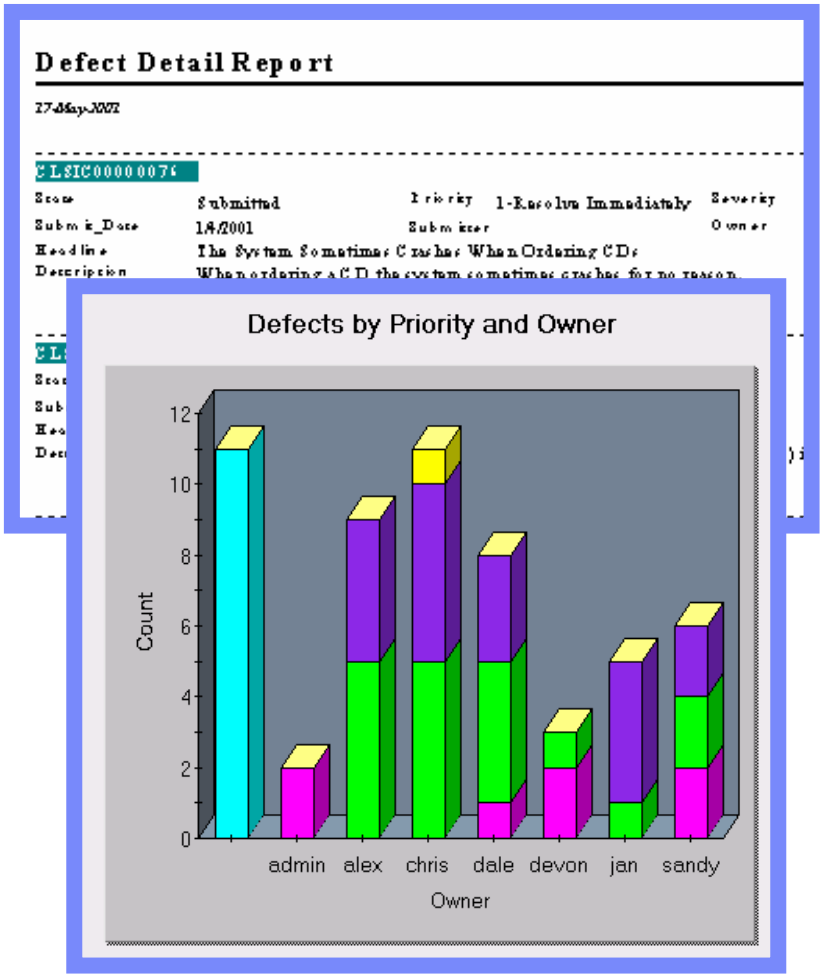
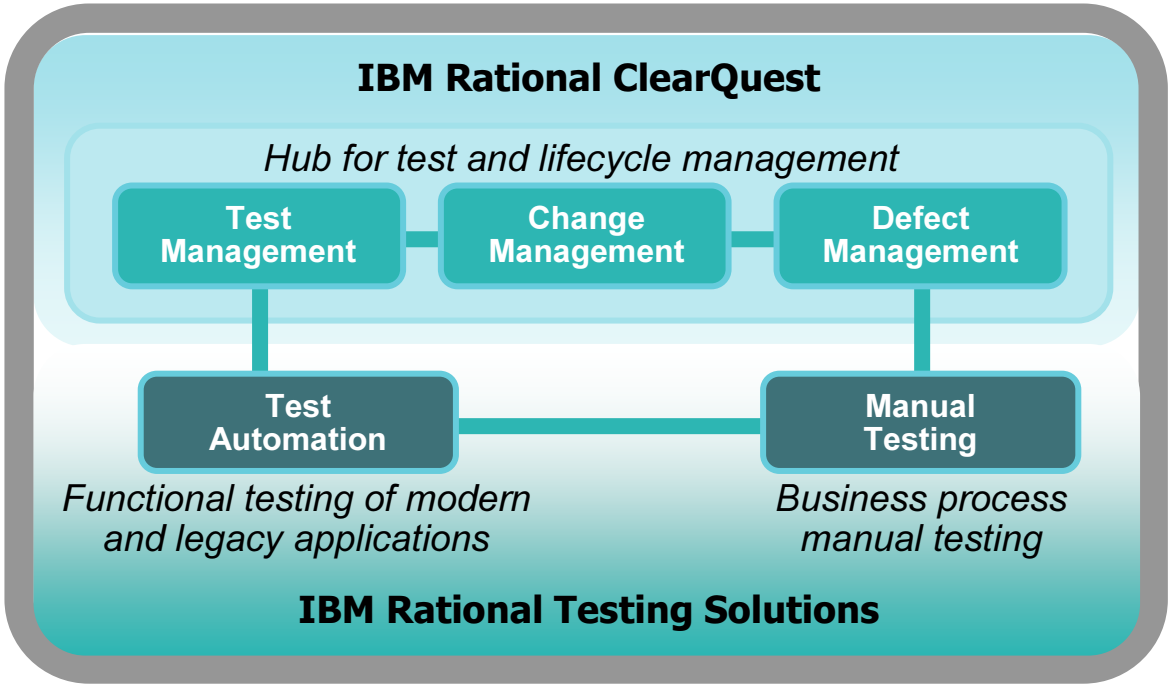
  - Easily create and modify with Wizards
  - Charts: Aging, Trend, Distribution
- Reports
  - Crystal Reports-based run-time engine
  - Export to many common formats (Excel, Word, HTML)
- E-mail notification rules
  - Automatic notification of events and state changes
  - Configurable through GUI interface
  - No programming required!



IBM Rational ClearQuest and Functional Testing

- Enterprise scalable, distributed test management
- Test process enforcement and customization
- Quality metrics
- Integrated test management and test automation tools
- Support for testing J2EE/Java, Web, .NET, Visual Basic, C/C++ and many other client-server software applications



IBM Rational ClearQuest
IBM Rational Functional Tester
IBM Rational Manual Tester
IBM Rational Robot

IBM Rational ClearQuest—Components

ClearQuest Maintenance Tool

Set up and connect to the schema repository during installation and when you upgrade to a new ClearQuest version.
Allows finer control over what databases are available to different groups
Secure login

ClearQuest Designer

Customize schemas; manage user databases; and administer users and user groups.

Choose from several “out of the box” schema implementations
Extend functionality using pre-defined Packages
Add fields and control behavior
Modify forms
Configure the State Transition Matrix
Extend your system with triggers, including automated email notifications

IBM Rational ClearQuest—Platforms

ClearQuest supported client platforms

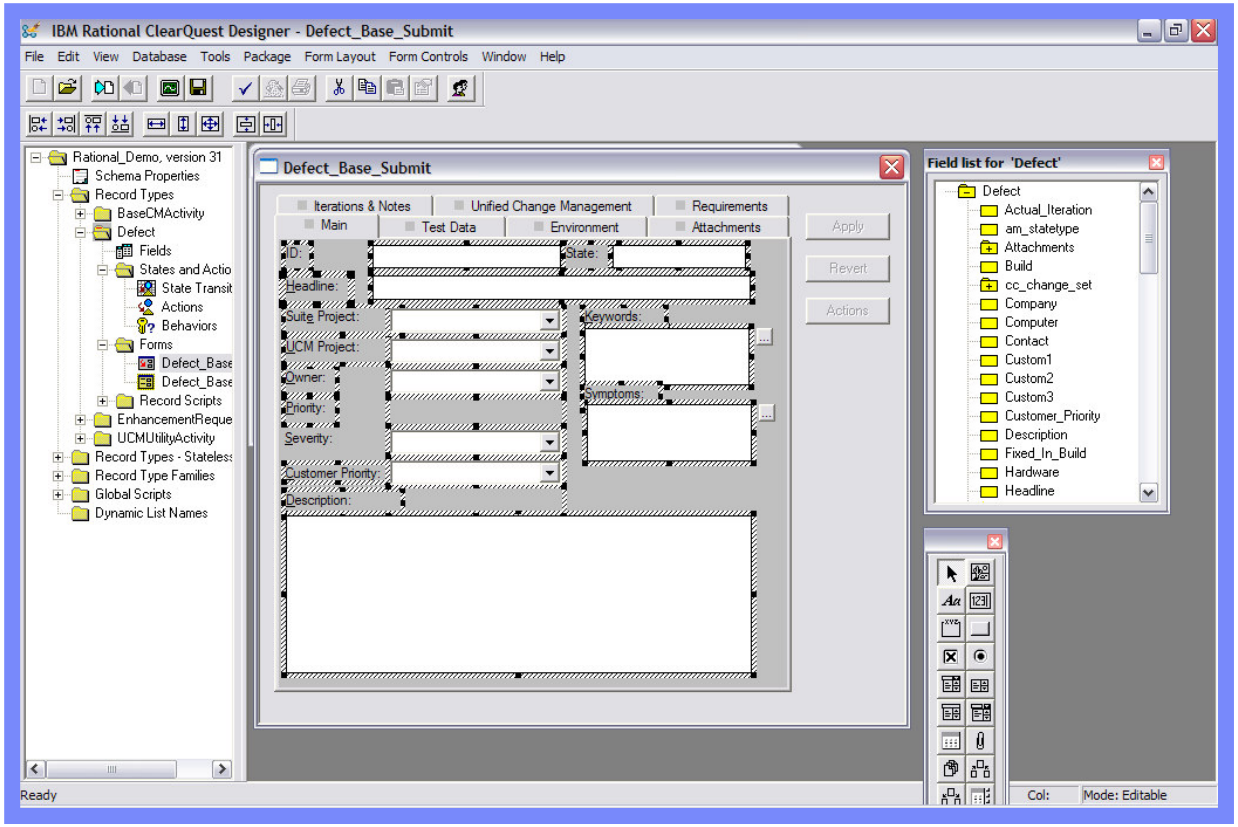
- Windows® client
  - Submit, modify, and track change requests, and analyze project progress by creating queries, reports, and charts
- Web client
  - Access IBM® Rational ClearQuest across multiple platforms by using a Web browser to submit, modify, and track change requests, and analyze project progress by creating queries and reports.
- Eclipse Client
  - Submit, modify, and track change requests, and analyze project progress by creating queries, reports, and charts.

ClearQuest supported database vendors

- DB2®
- Oracle®
- Microsoft SQL Server®
- Microsoft Access®

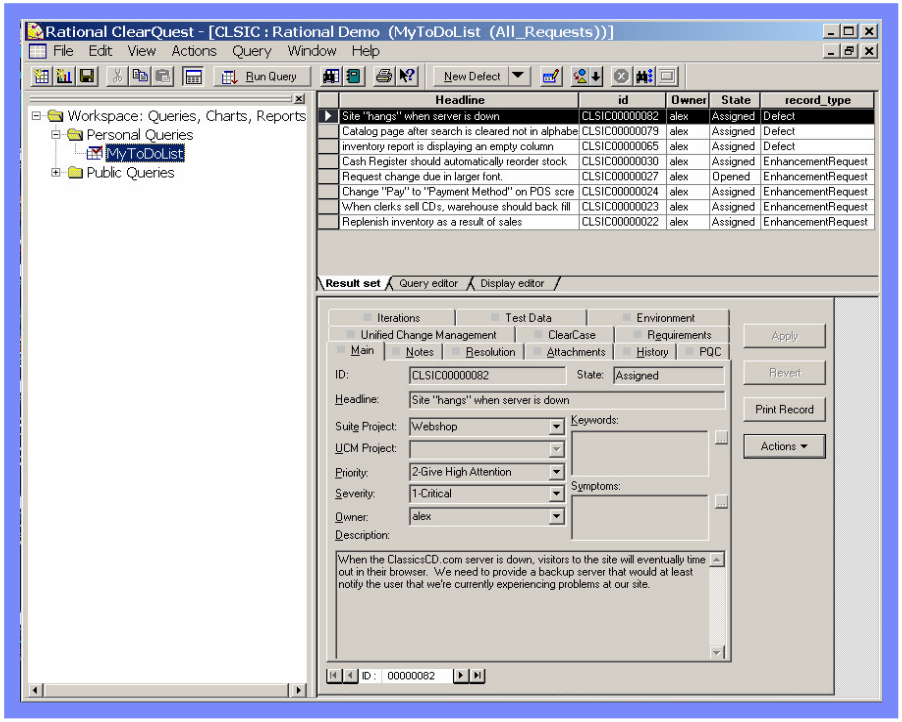
IBM Rational ClearQuest Designer

- Create new fields of any type
  - Integer, date/time, short string, multi-line string, attachment list, reference, reference list
- Easily set a field's behavior
- Built-in visual form editor
- A state machine controls the flow of records through your system

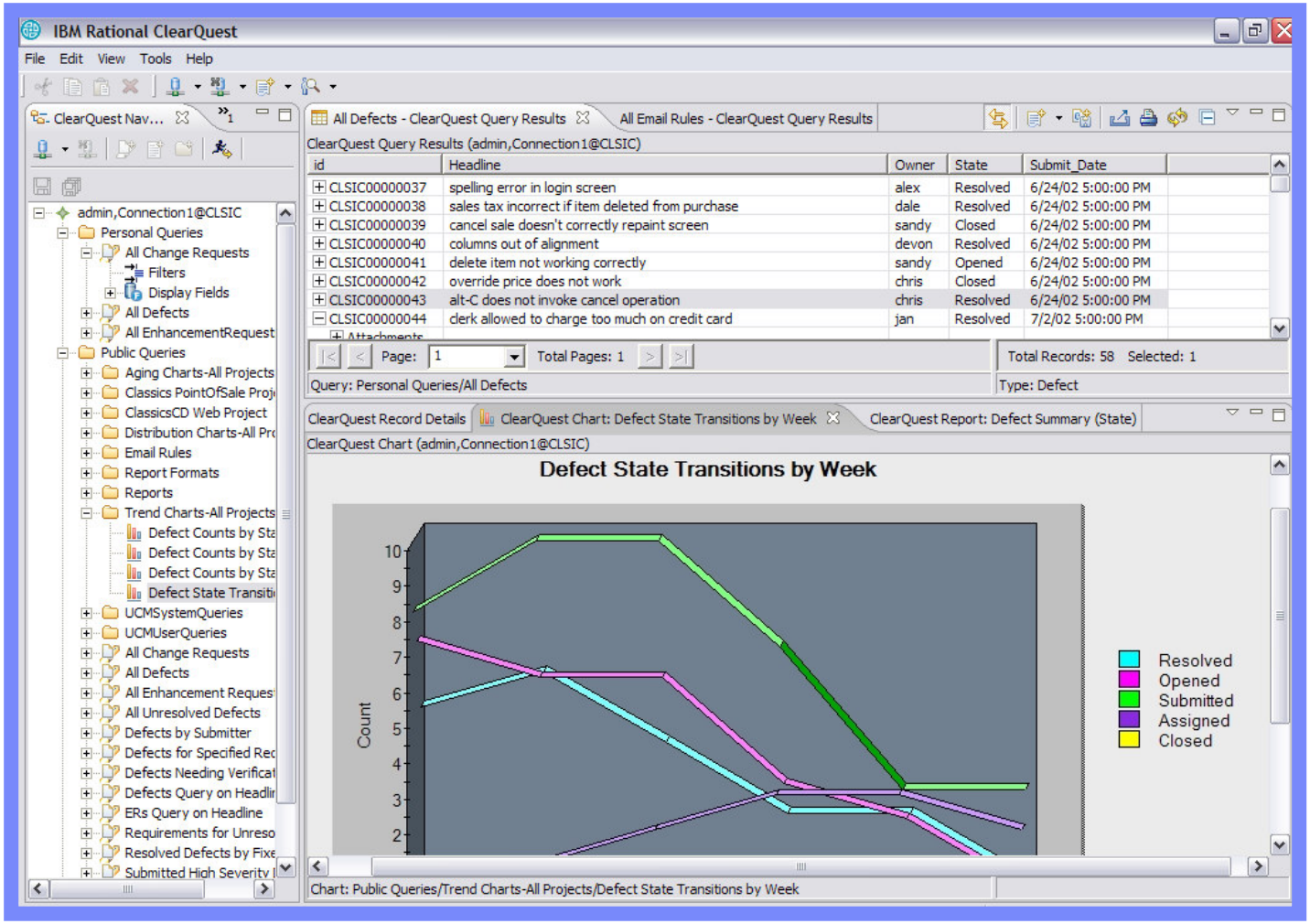


Improving individual and team effectiveness

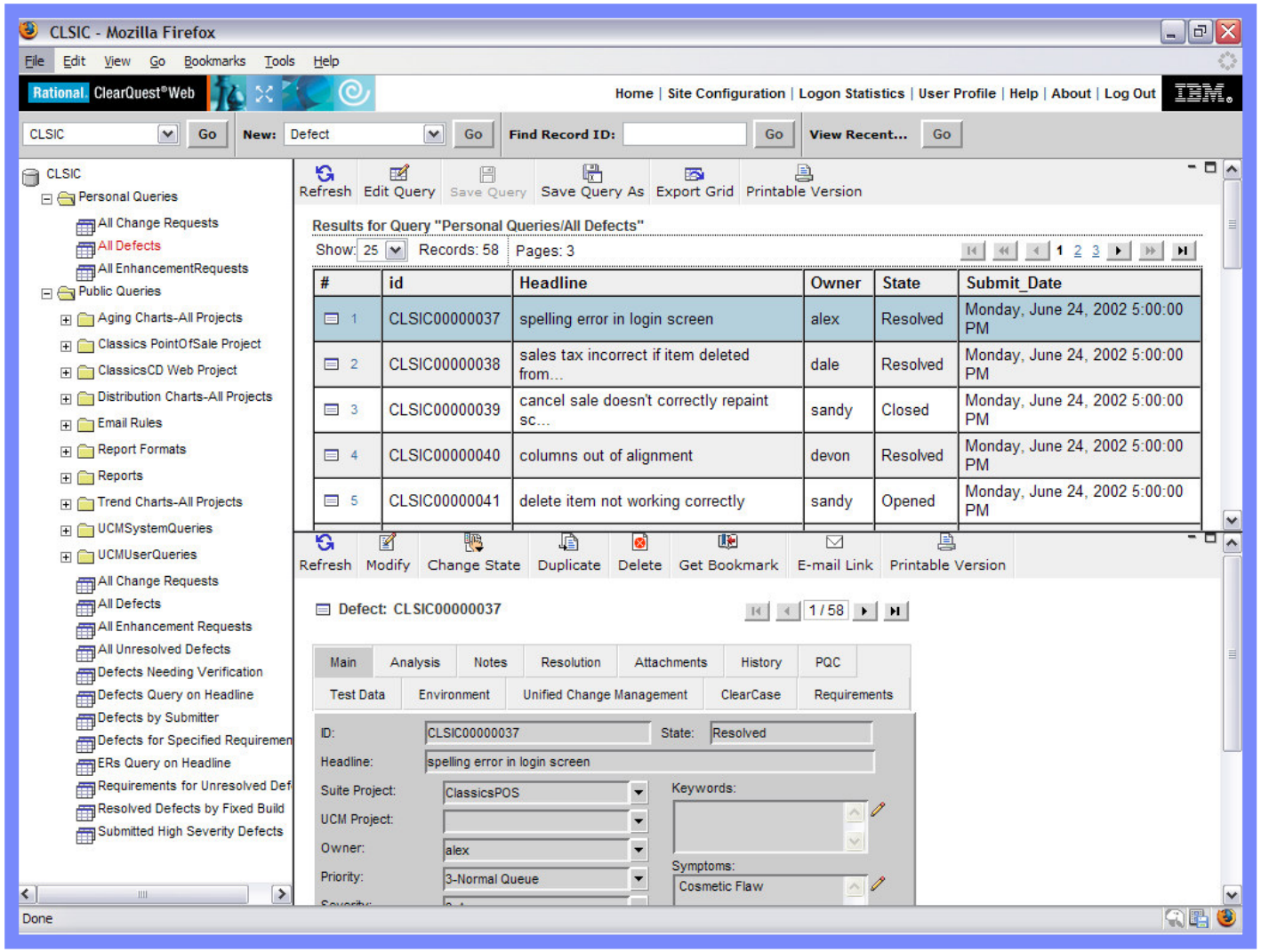
- To-do list
  - “What change requests have been assigned to me?”
  - “What should I work on first”



IBM Rational ClearQuest Eclipse Client

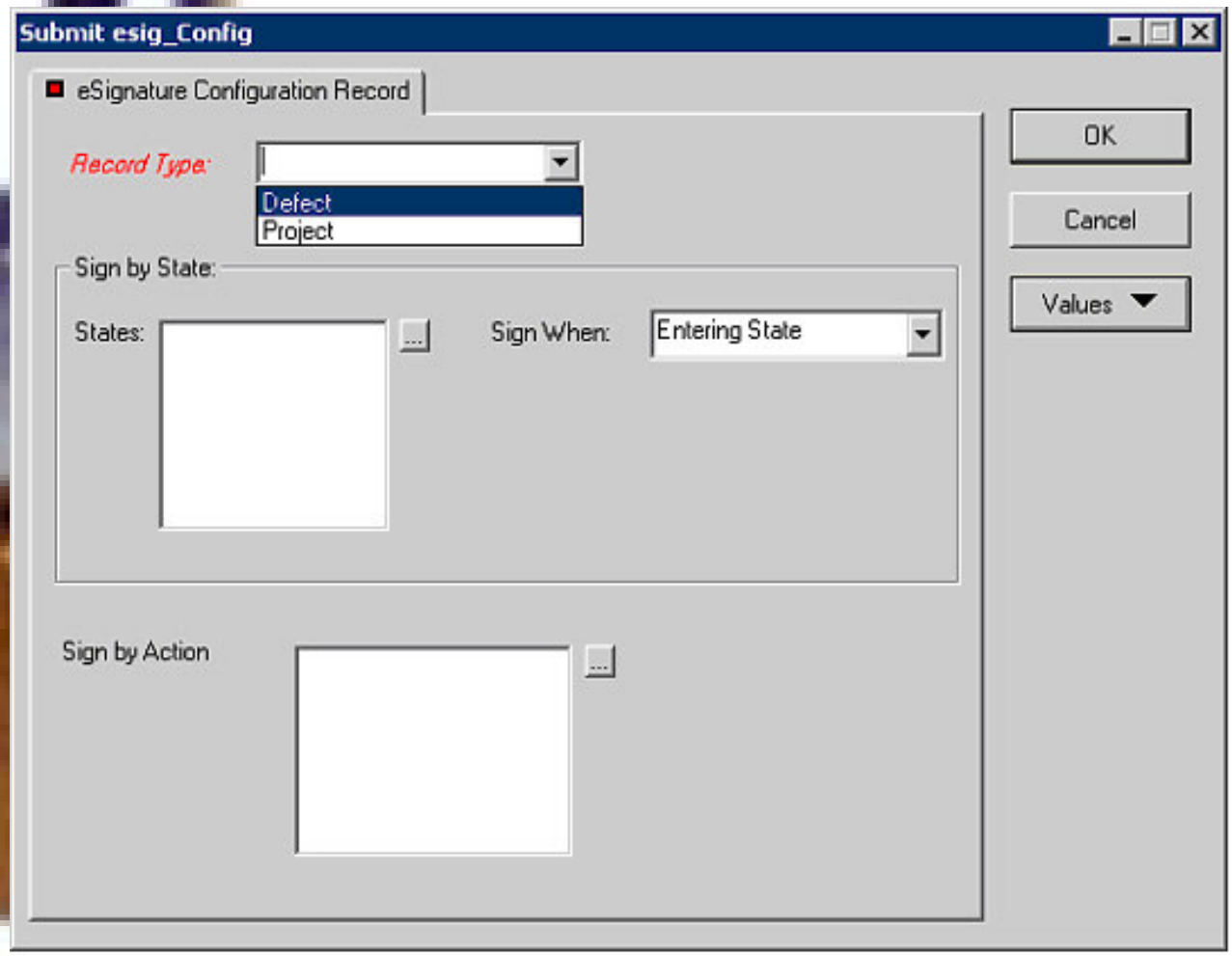


IBM Rational ClearQuest Web Client

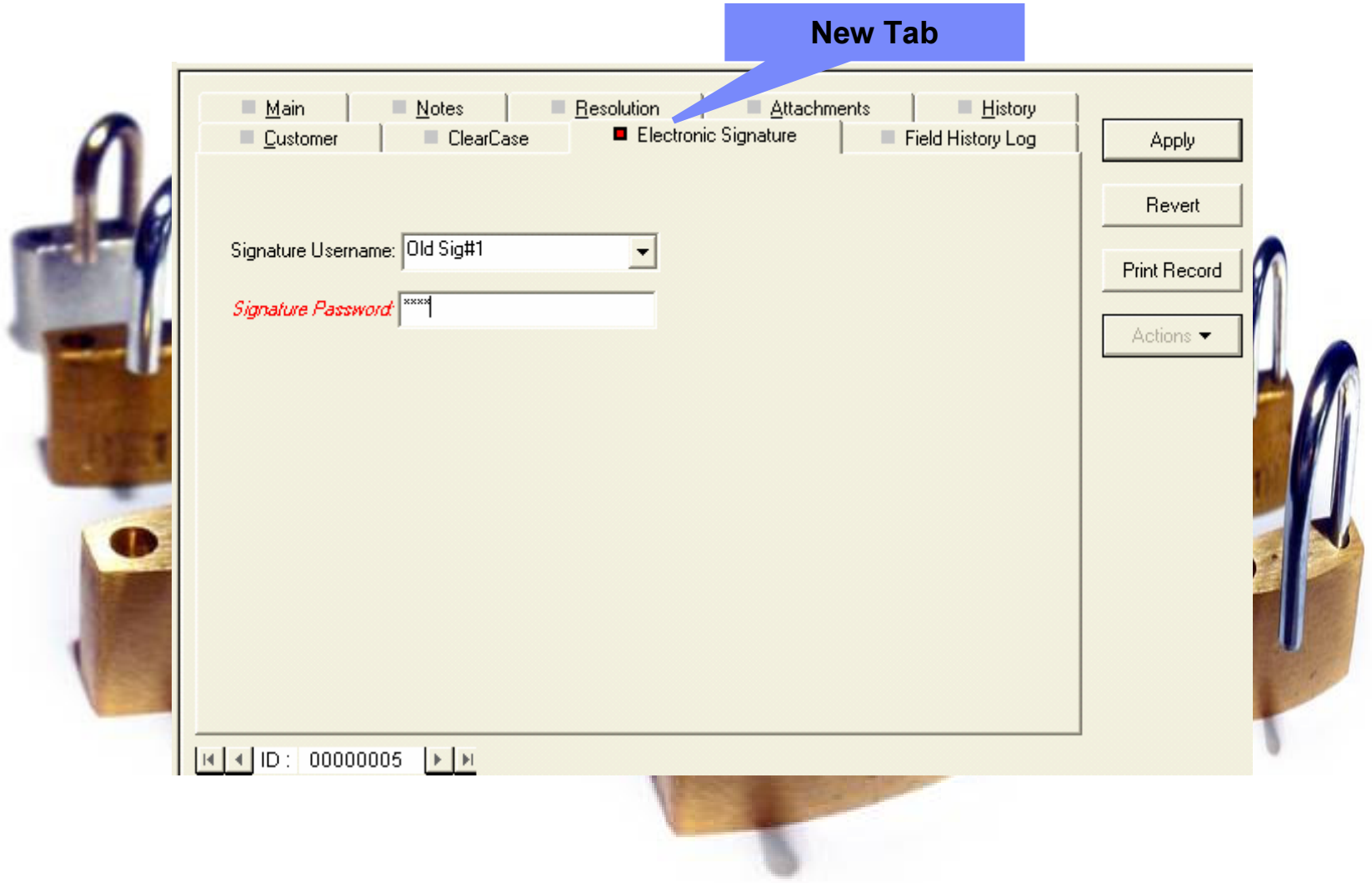


Security and Compliance made easier

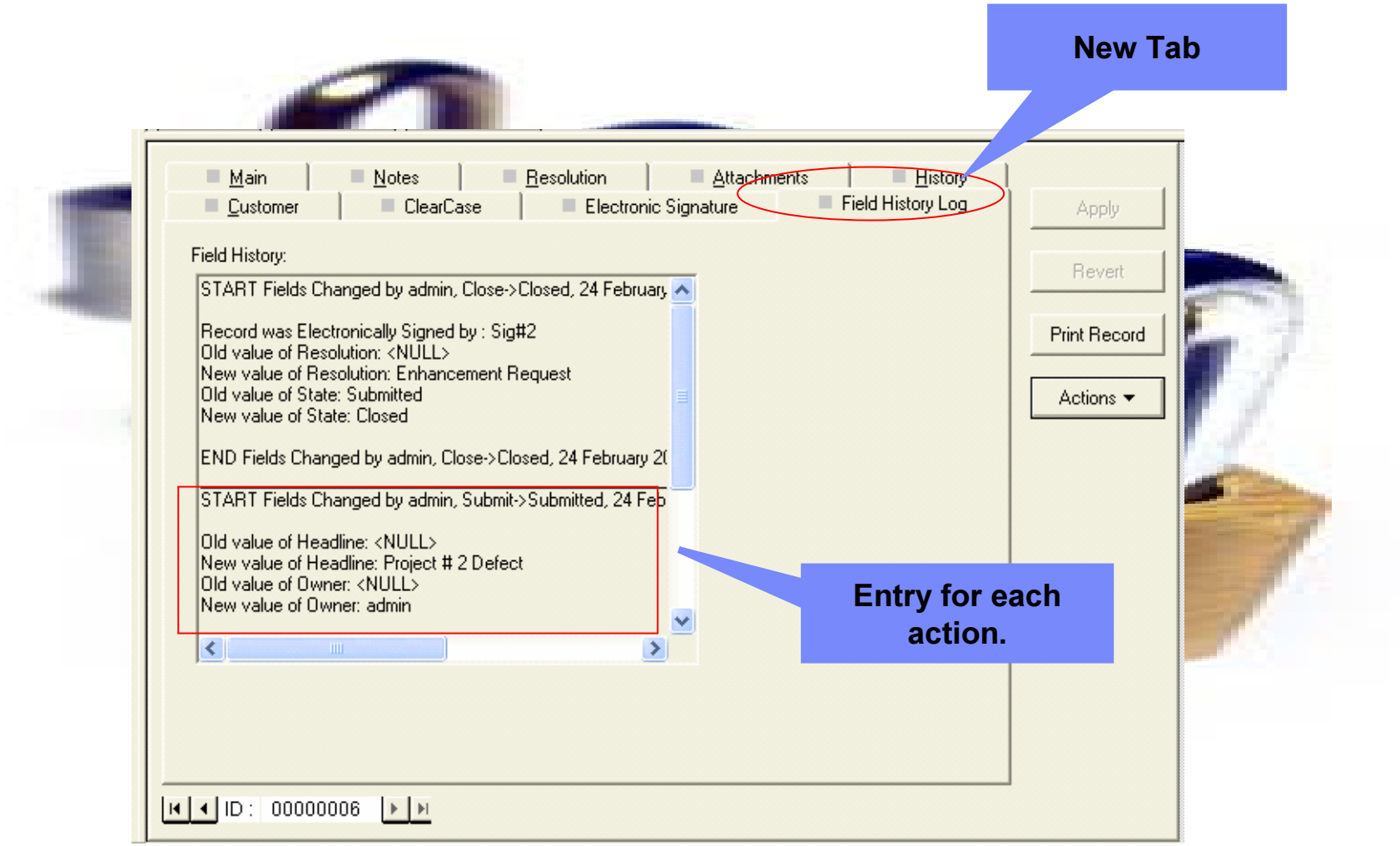
- Decide what records and states require Electronic Signature Tracking
- ClearCase and ClearQuest secured entry with LDAP authentication
- Secure Repository for managed assets



ClearQuest Electronic Signatures



ClearQuest Field change logging



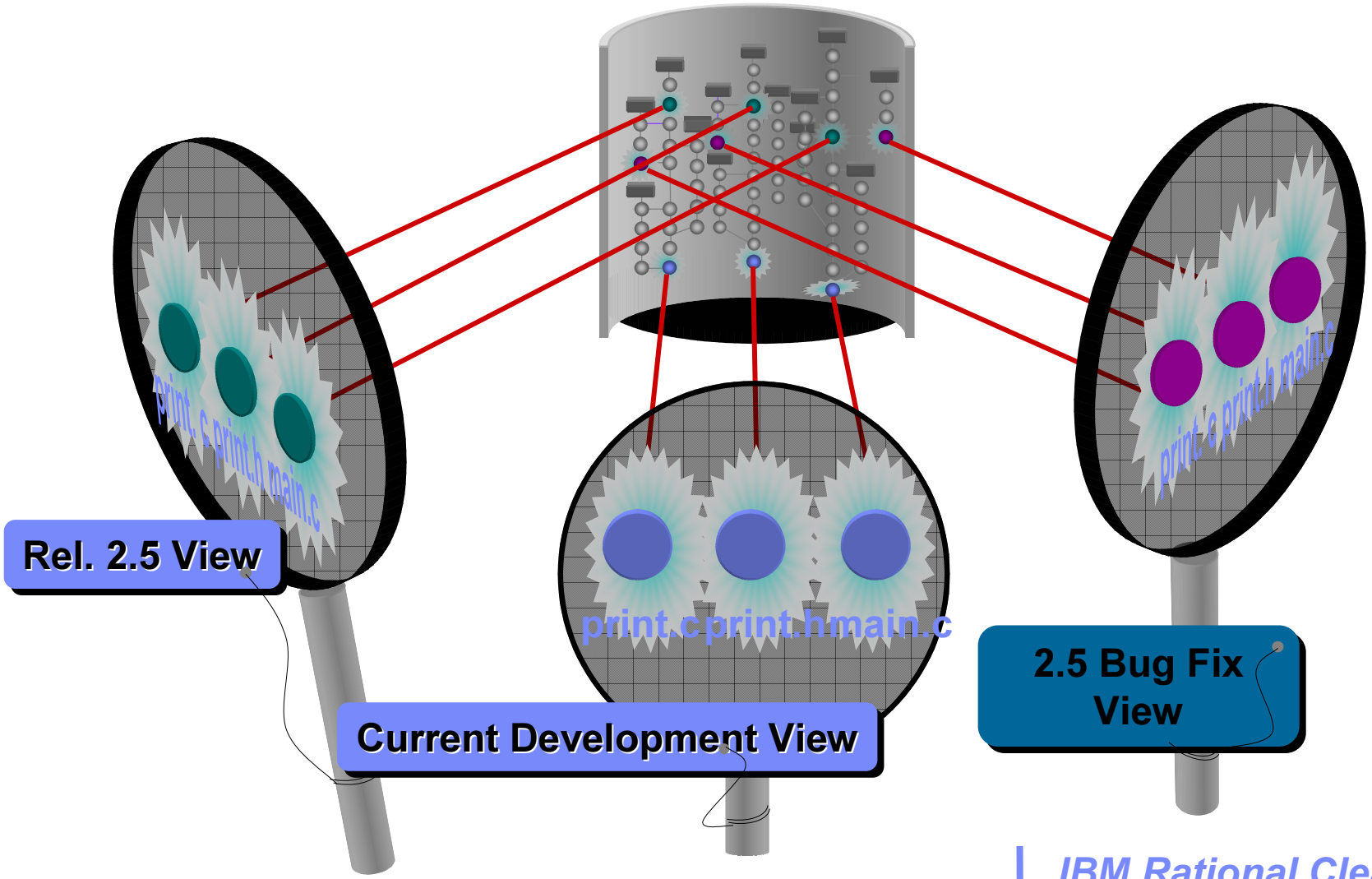
IBM Rational ClearQuest Integrations:

- Rational ClearCase
- Rational BuildForge
- Rational RequisitePro
- IBM Tivoli Provisioning Manager
- Rational Portfolio Manager
- Microsoft MS Project®
- DOORS

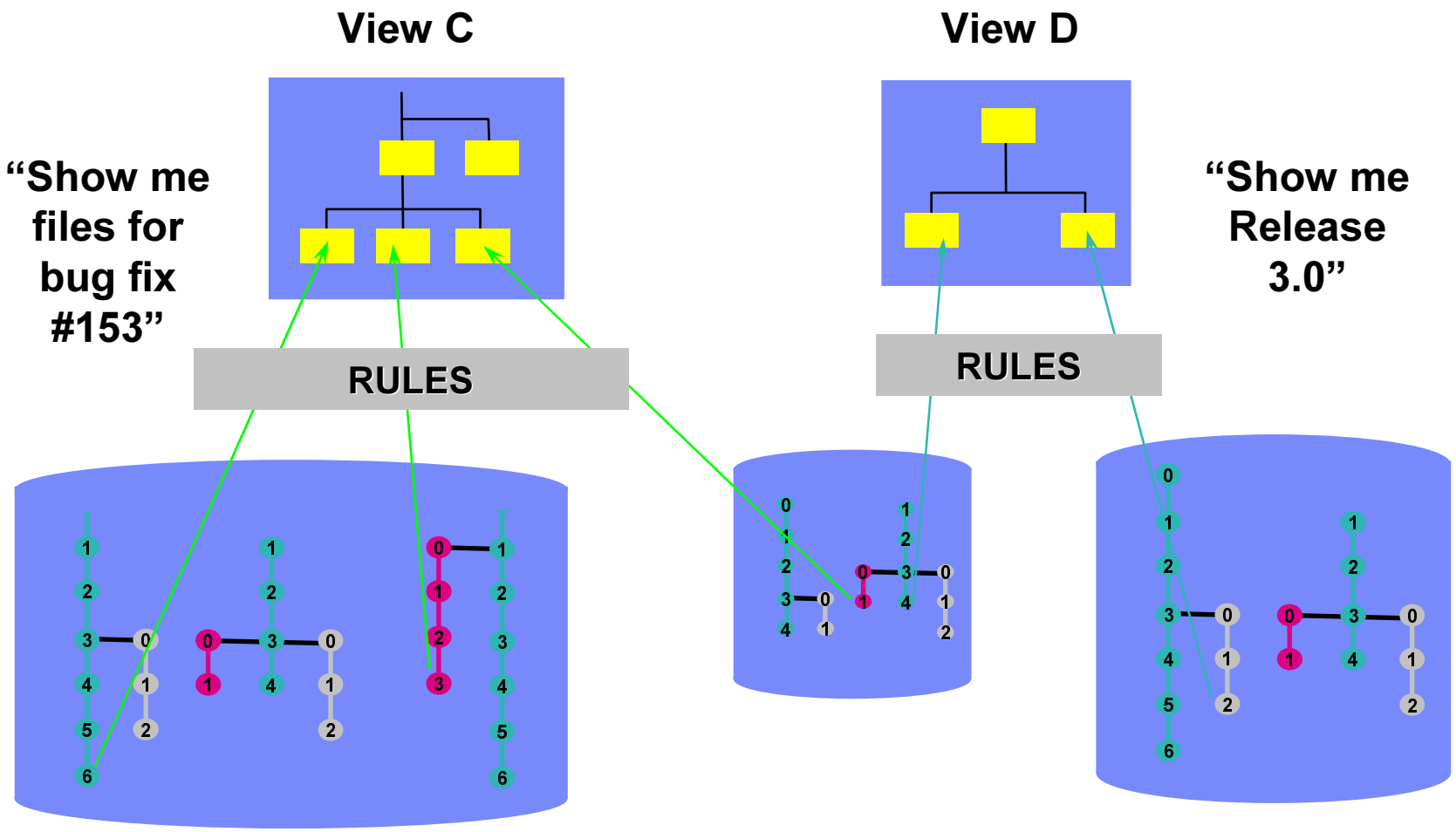
IBM Rational **ClearCase**
Primary functions

- ClearCase
  - Sophisticated version control, automated workspace management, parallel development support, baseline management, build and release management improves productivity and operational efficiency
  - Heterogeneous, cross-platform support for distributed, mainframe (IBM z/OS®) and midrange (IBM i5/OS®) development enables platform flexibility and enterprise-wide application development
  - Accessible through local, remote and Web interfaces, and leading IDEs including IBM Rational Application Developer, IBM WebSphere Studio, Microsoft® Visual Studio 2005 and the Eclipse framework
  - Deep integration with requirements, development, build, test and deployment tools provides a complete end-to-end solution to meet current and future needs
  - Operating systems supported: Linux, UNIX, Windows, Linux s/390

Easy to Use: ClearCase Views

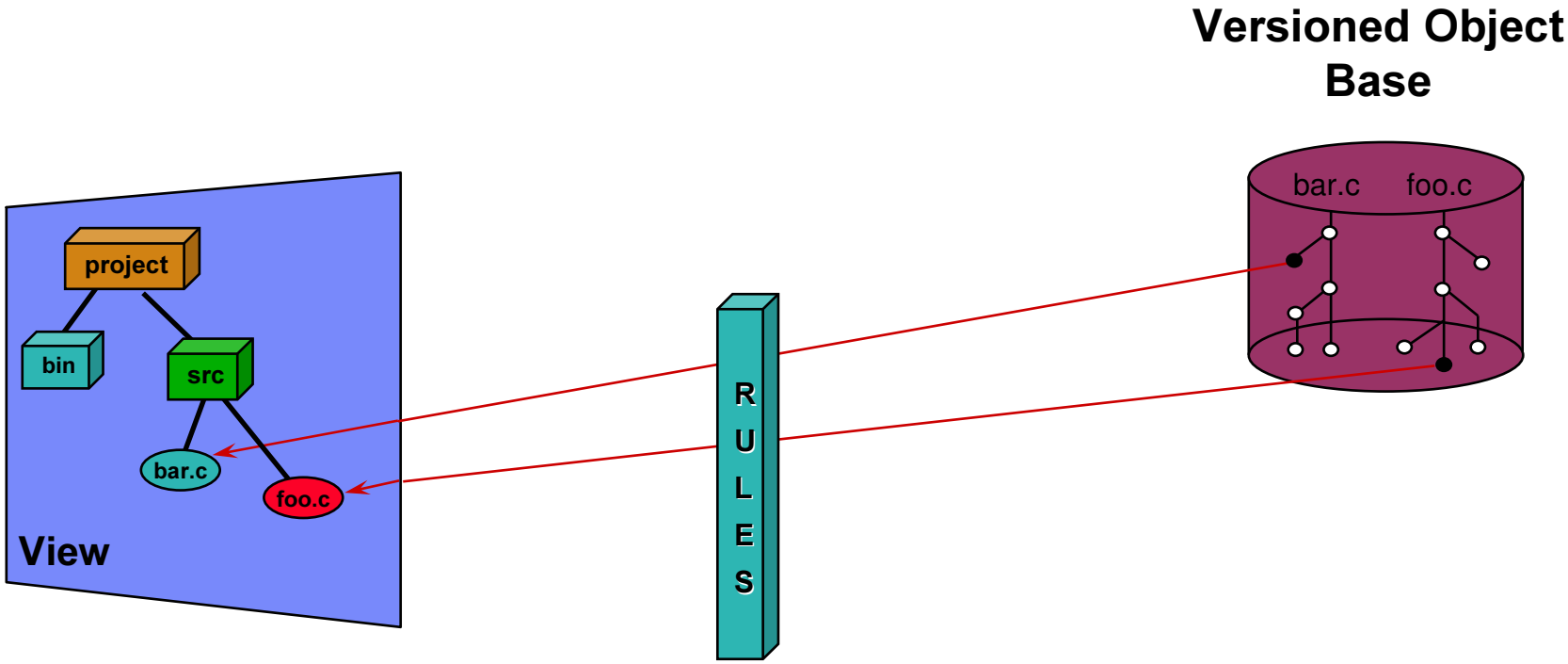


ClearCase *views* are configurations



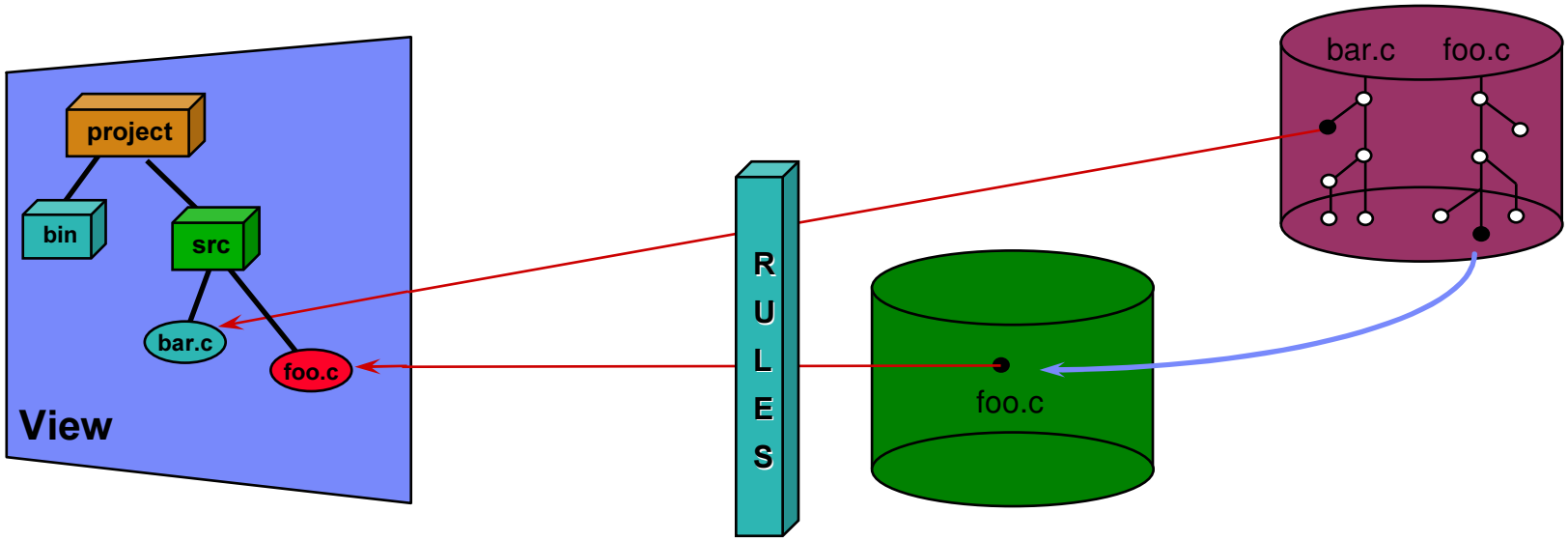
Easy to use: Dynamic views transparent access

- View Before Checkout of foo.c

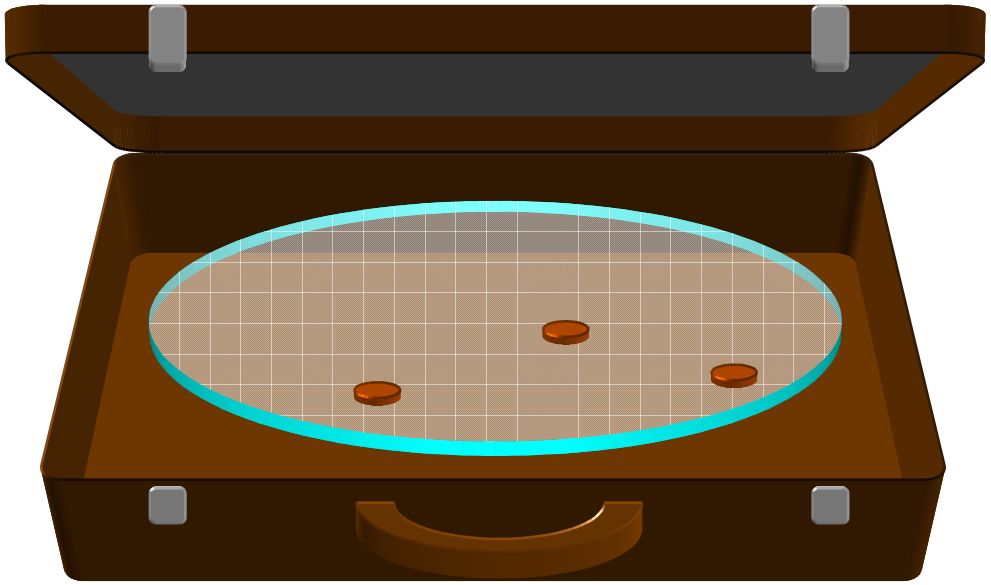


Easy to use: Dynamic views transparent access

- View After Checkout of foo.c

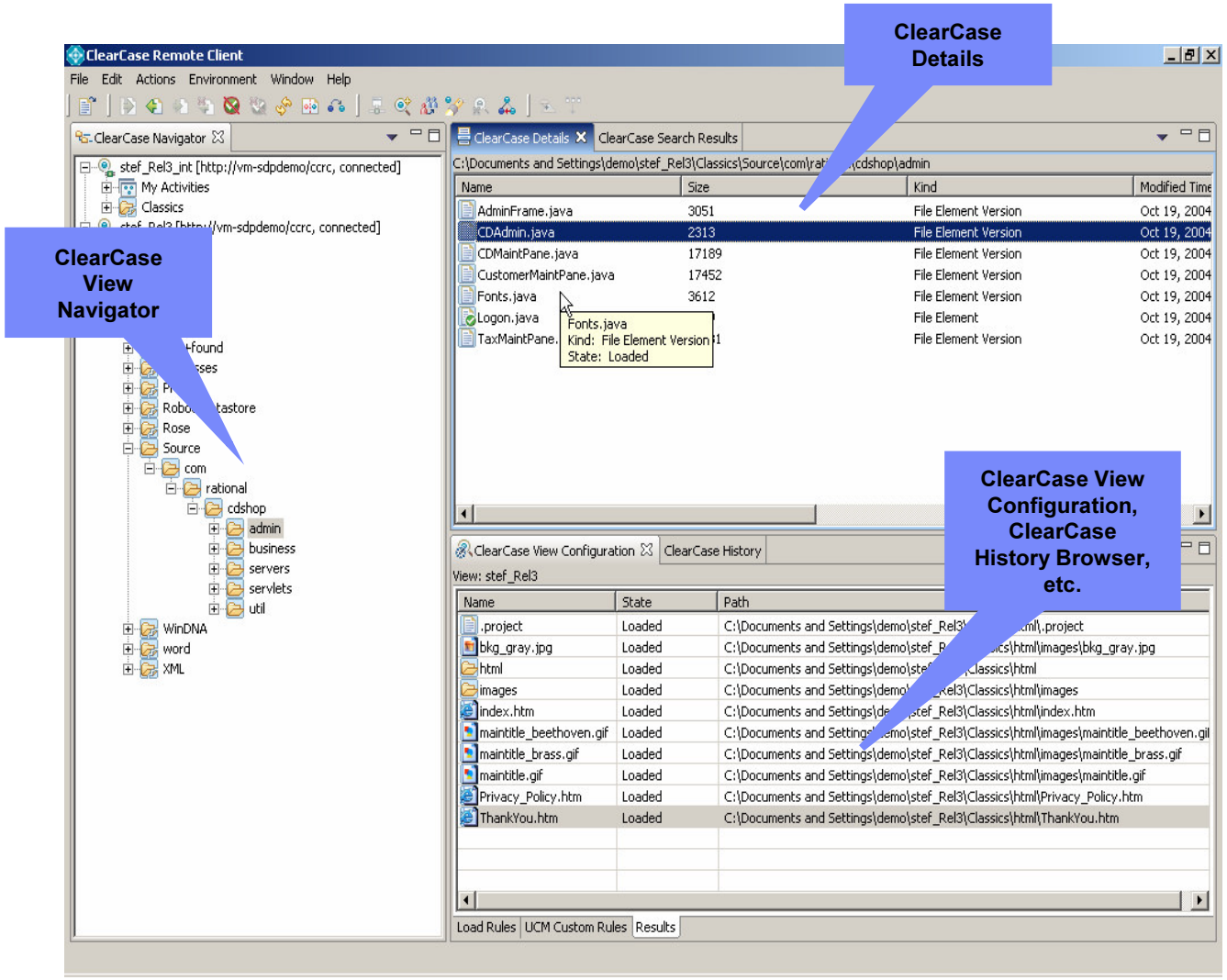


Easy to use: ClearCase snapshot views



- Snapshot Views enable reliable disconnected use
- Makes a controlled copy of the right configuration on your disk
  - Still under ClearCase control
  - Native filesystem access times
- Work away from office
  - Periodic updates only
  - Local builds
  - Automatically re-synchronizes your work with the ClearCase repository

ClearCase/ClearQuest and Eclipse (CCRC)



Eclipse

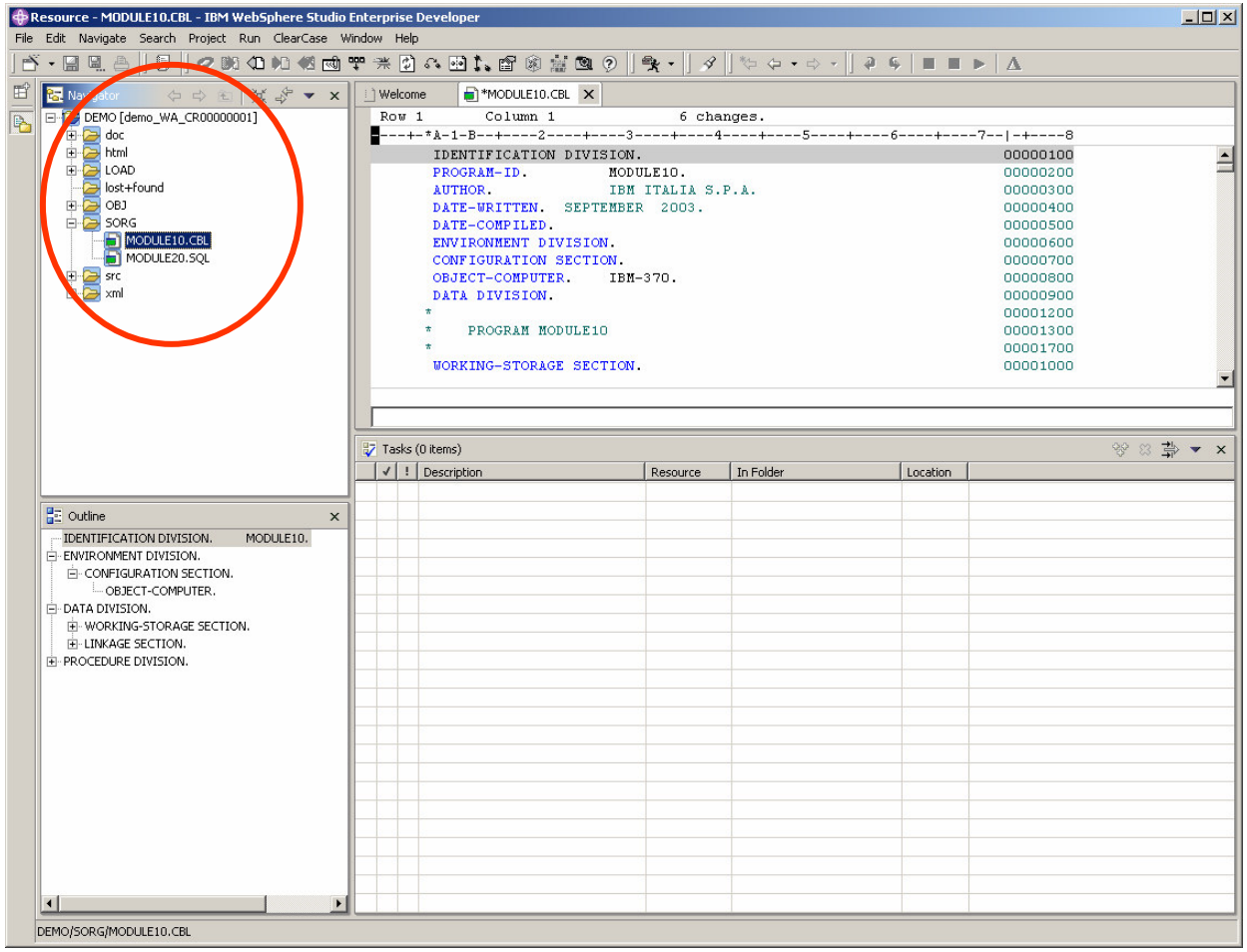
UNIX/Linux

ISPF

CLI

Browser

ClearCase/ClearQuest and Eclipse (WDz - MVS)



Eclipse

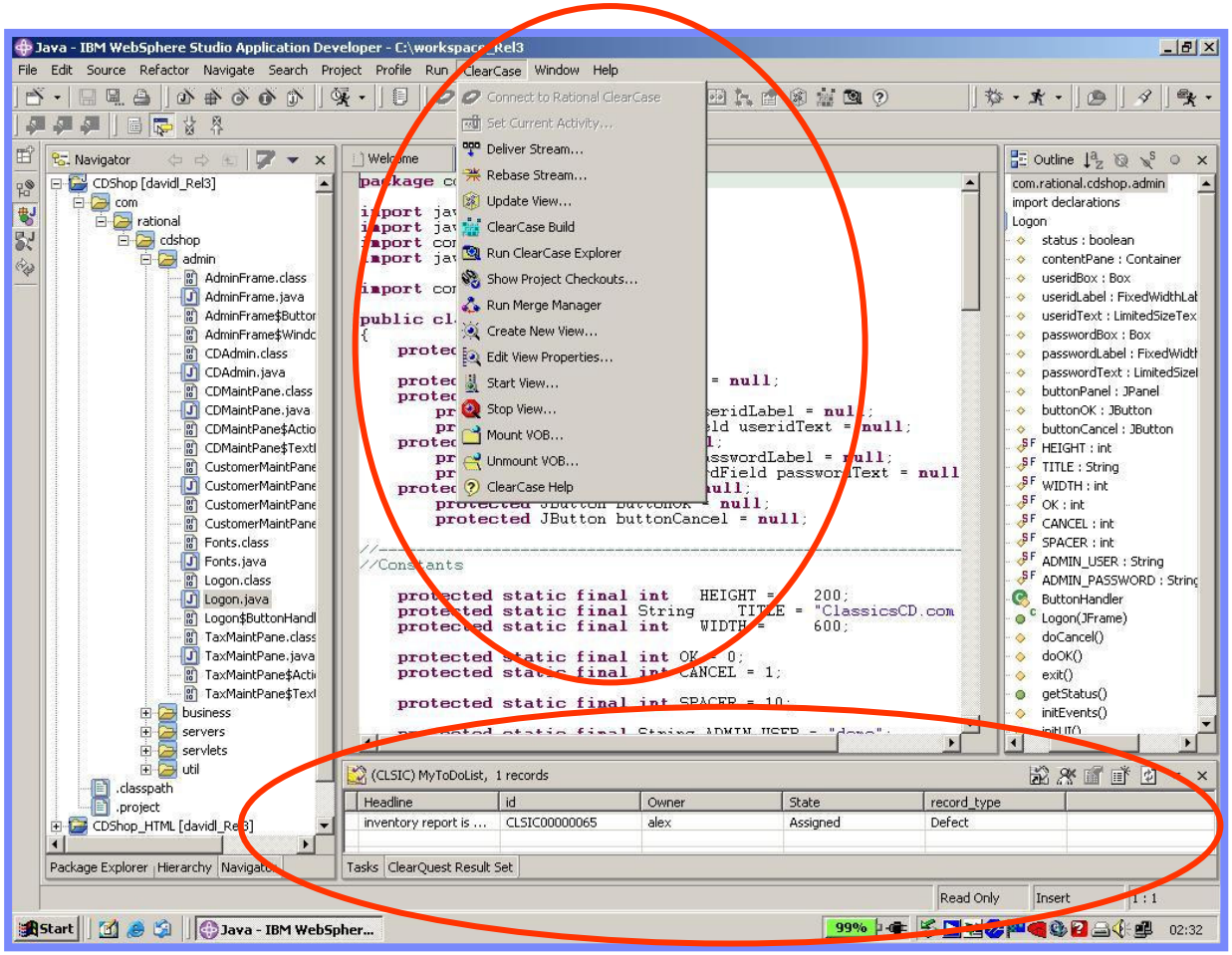
UNIX/Linux

ISPF

CLI

Browser

ClearCase/ClearQuest and Eclipse (WSAD / RAD / RSA)



Eclipse

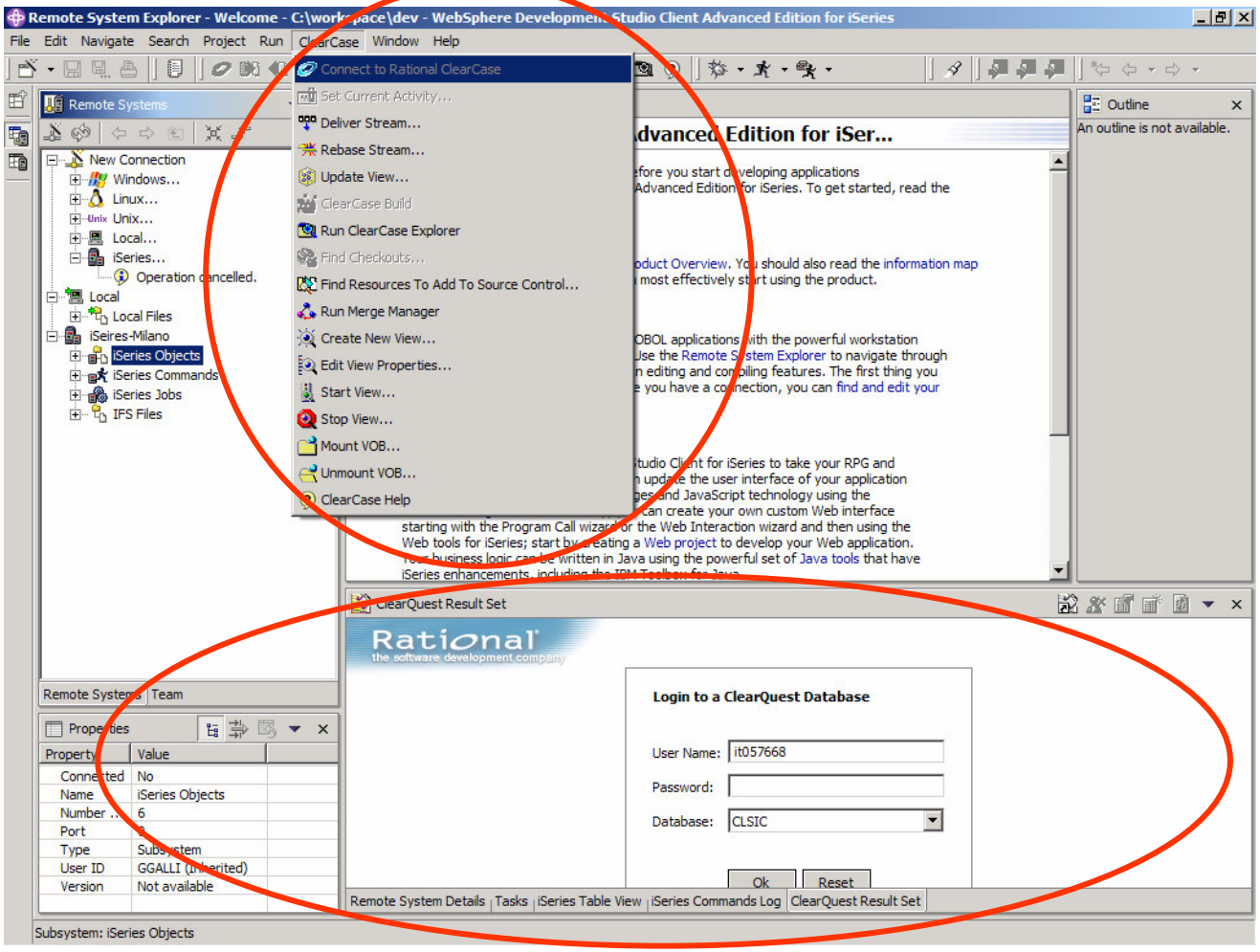
UNIX/Linux

ISPF

CLI

Browser

ClearCase/ClearQuest and Eclipse (WDSC – AS/400)



Eclipse

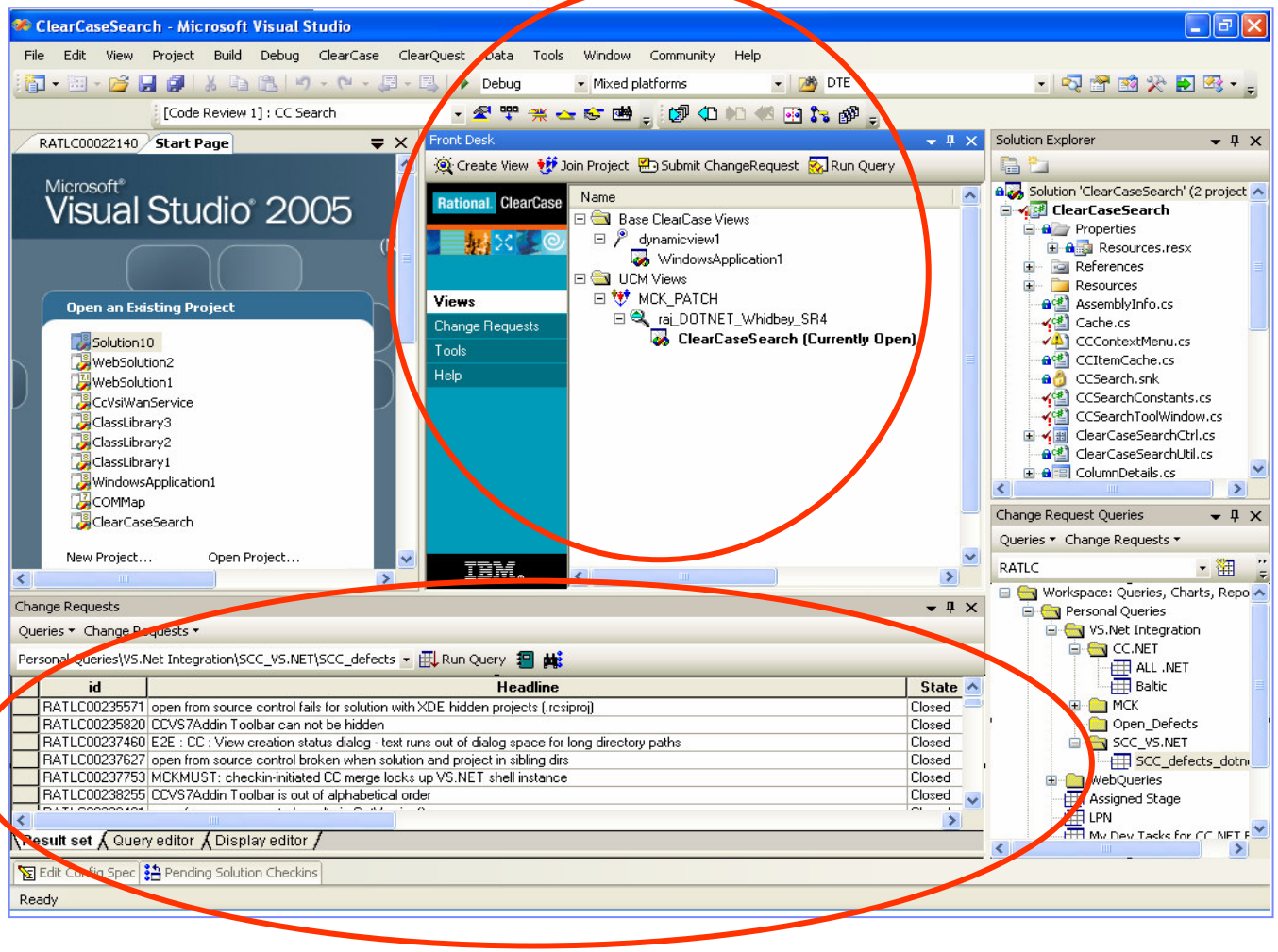
UNIX/Linux

ISPF

CLI

Browser

ClearCase/ClearQuest and Microsoft IDEs (V*)



Windows

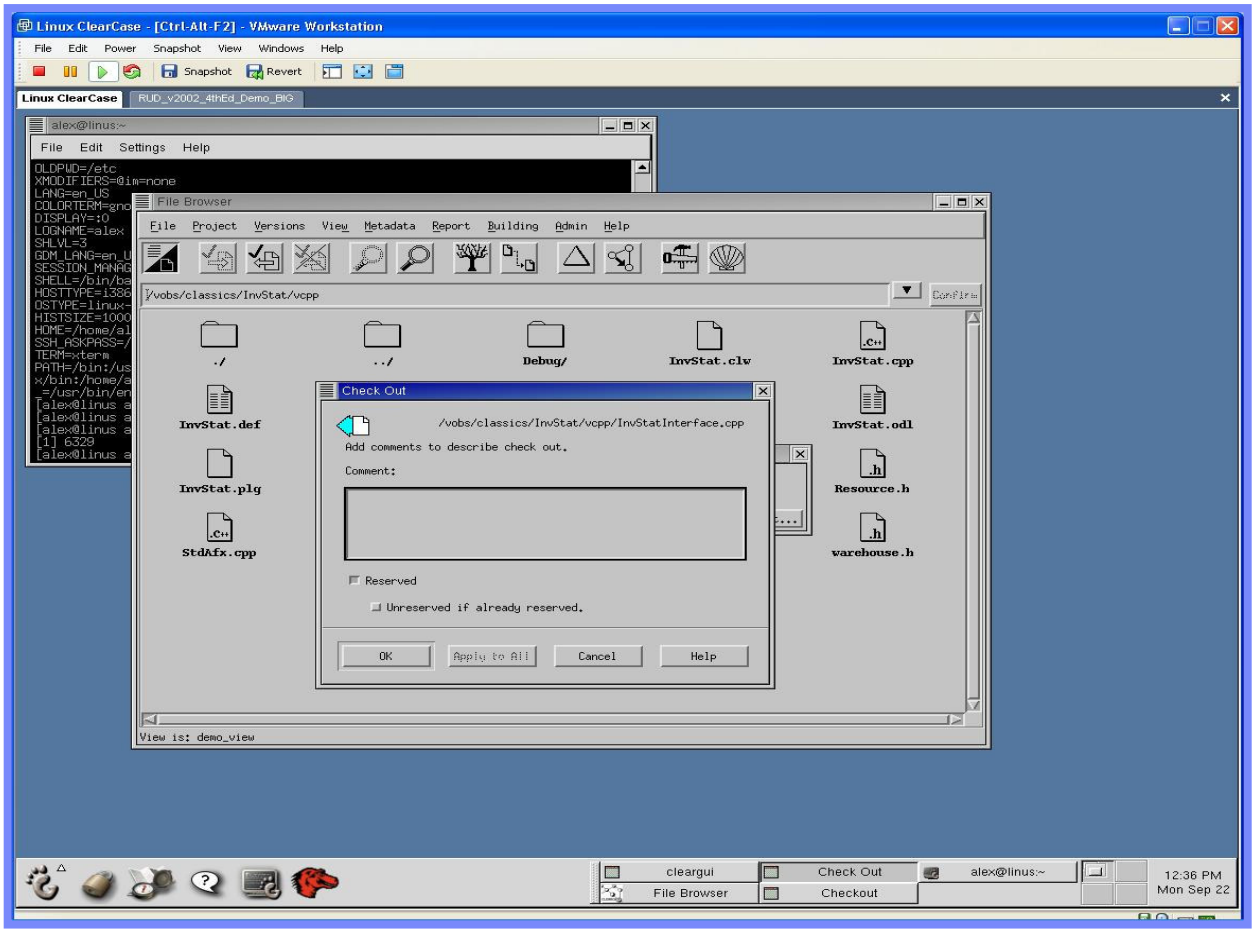
UNIX/Linux

ISPF

CLI

Browser

ClearCase/ClearQuest and Linux



Eclipse

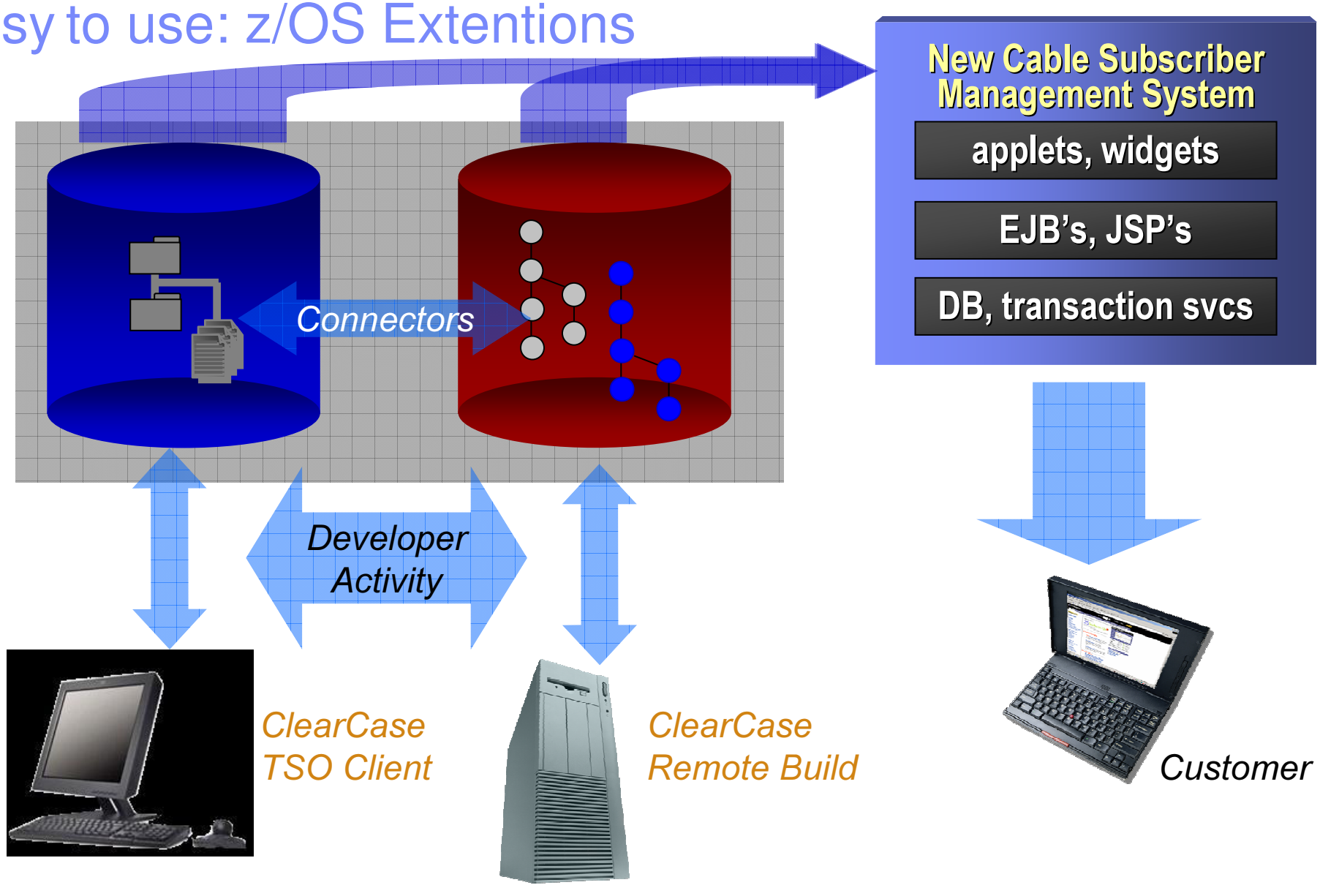
UNIX/Linux

ISPF

CLI

Browser

Easy to use: z/OS Extentions



ClearCase z/OS Extentions – TSO Client Feature

```
Command ===>

          Rational Clearcase Mainframe Connectors TSO Client
                  Select Action for Member:     2.2.1

Option ==>

          1. Check Out              4. Compare With Previous Version
          2. Check In               5. Show Version Tree
          3. Undo Check Out         6. Add to Source Control

    Comment for check out and check in option:

     PF01=ClearCase Help                  PF03=Return to ViewFile List

MA    b                                                        09/014
```

Eclipse

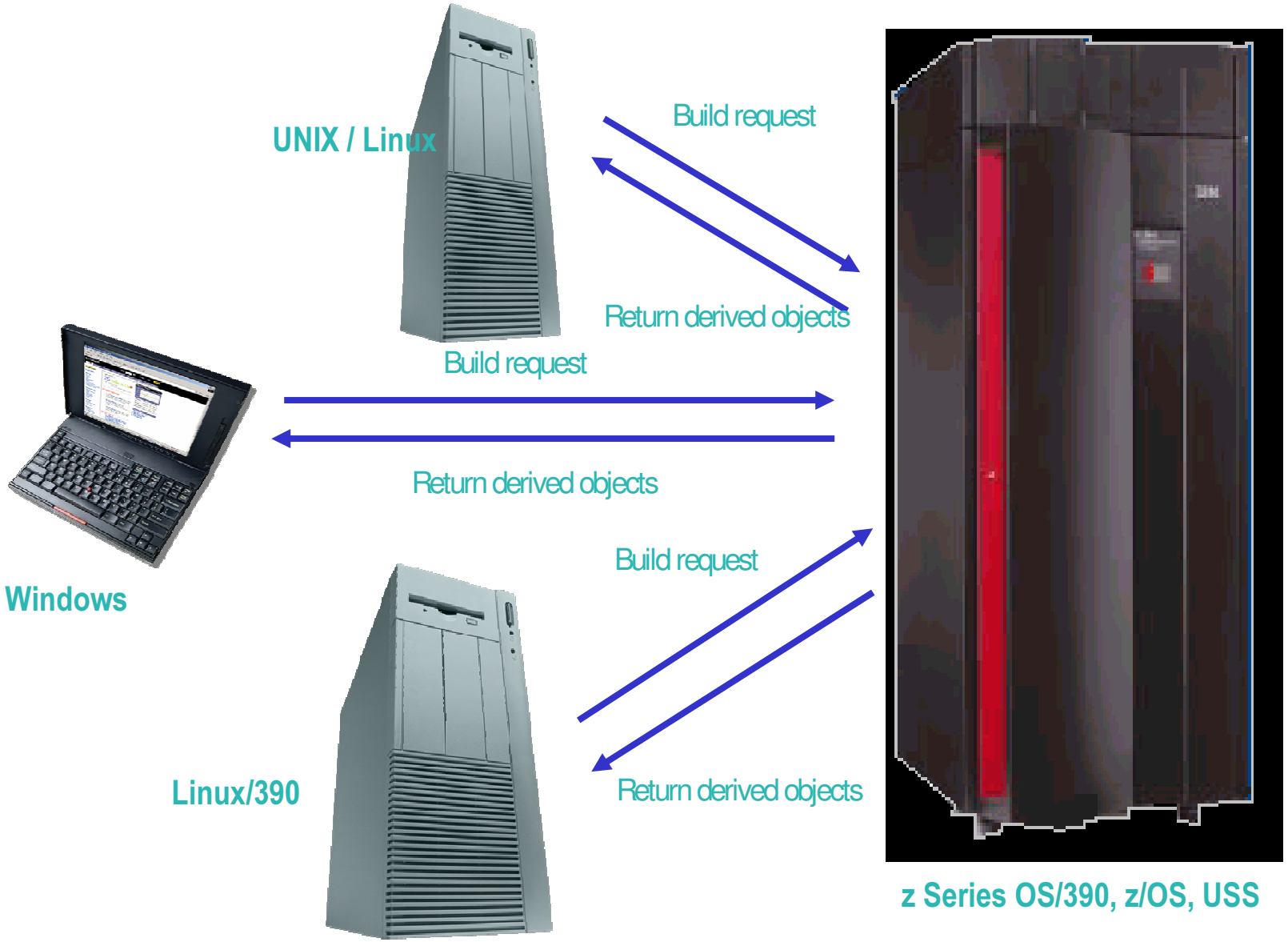
UNIX/Linux

ISPF

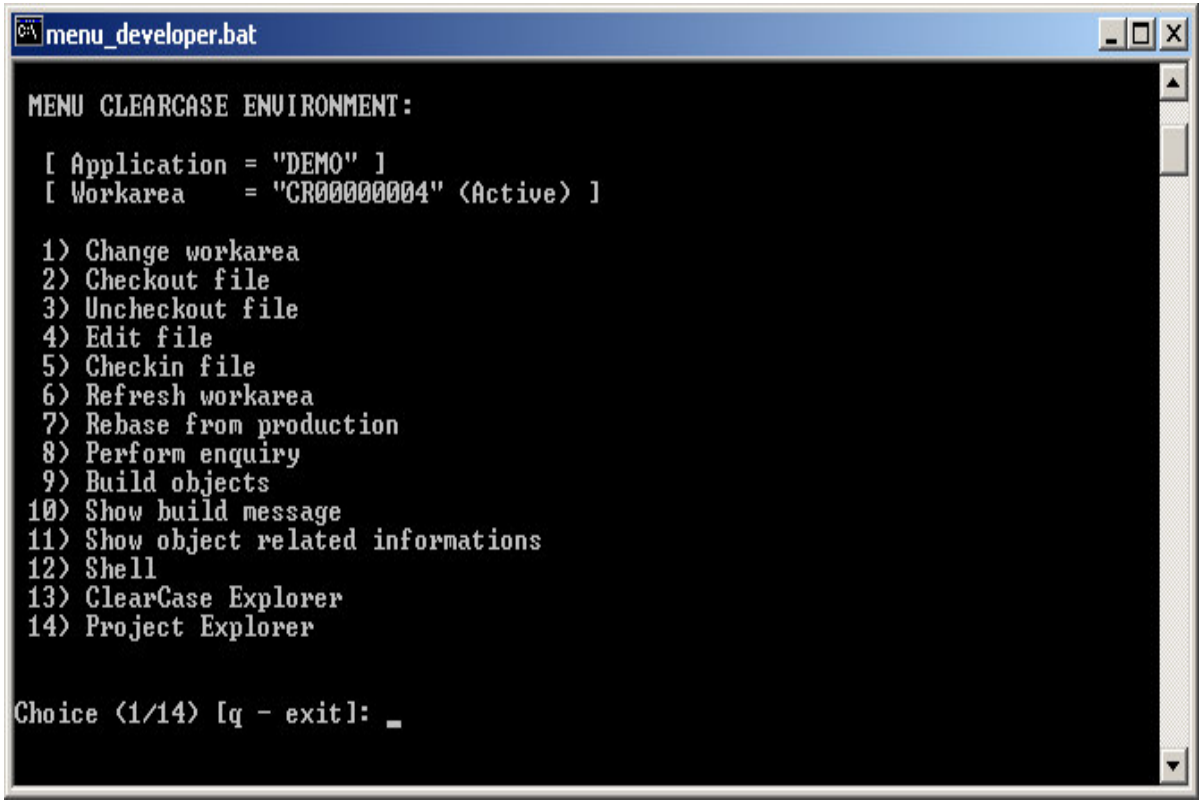
CLI

Browser

ClearCase z/OS Extentions - Remote Build Feature



ClearCase/ClearQuest and Command Line Interface



(example of custom interface)

Eclipse

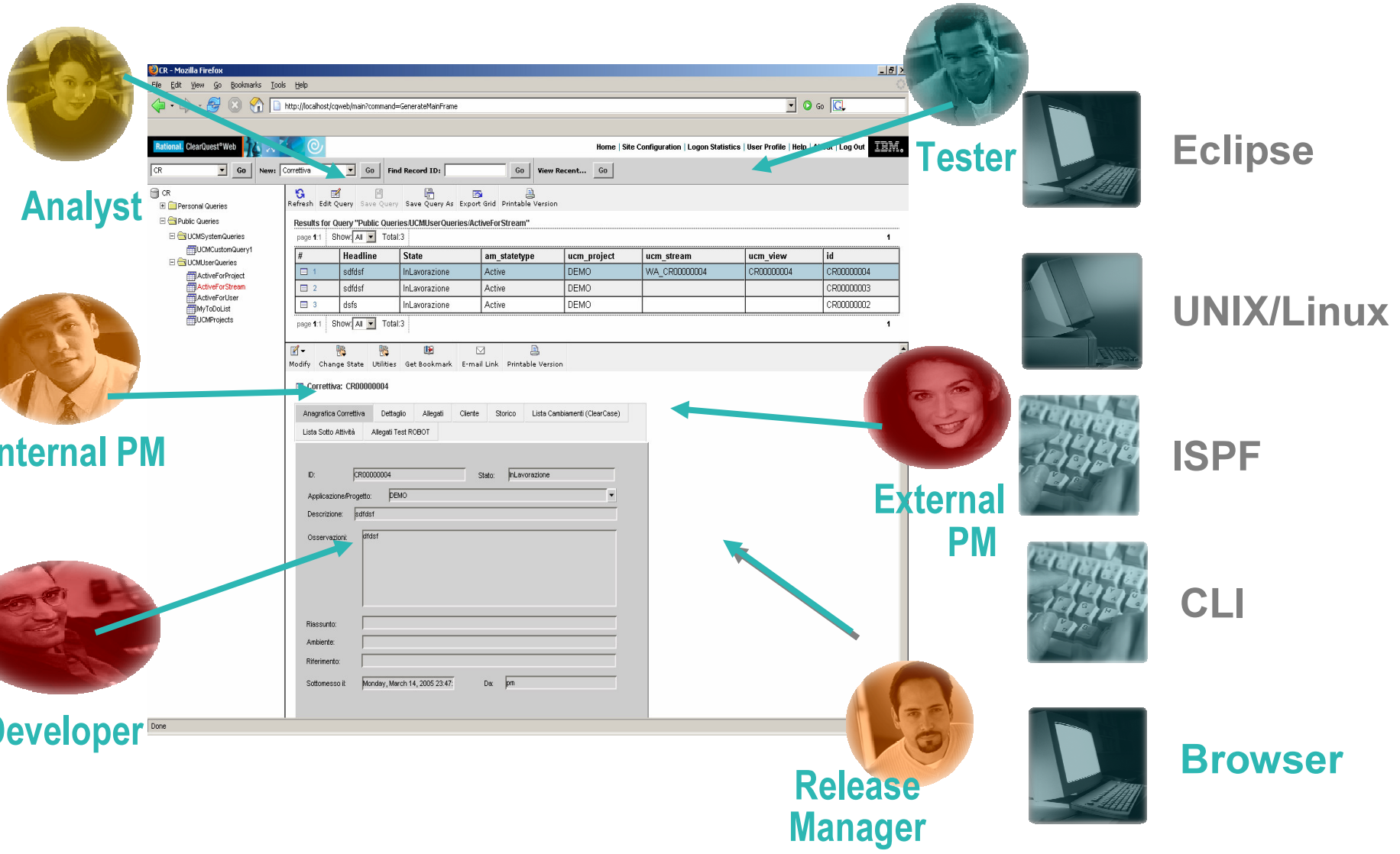
UNIX/Linux

ISPF

CLI

Browser

ClearCase/ClearQuest and Web Interface



Accelerate productivity with parallel development

IBM Rational ClearCase and IBM ClearQuest…

- Make parallel development practical
  - Private workspaces, automatic coordination with rest of team
  - Work simultaneously on multiple releases
  - Coordinated workflows across the team
  - Secure, versioned software assets
- Help teams collaborate and communicate
- Benefit the entire development team
  - Developers
  - Analysts
  - Content contributors
  - Integrators
  - Testers
  - Project Managers

Activity-Based Change Management

Unified Change Management (UCM)

- UCM Activities automatically manage Change Sets
  - Activities in IBM Rational ClearQuest track IBM Rational ClearCase assets
  - Developers, Integrators, Testers work with Activities, not low-level assets

IBM Rational ClearQuest

Manages activities

- To Do Lists
- Workflow

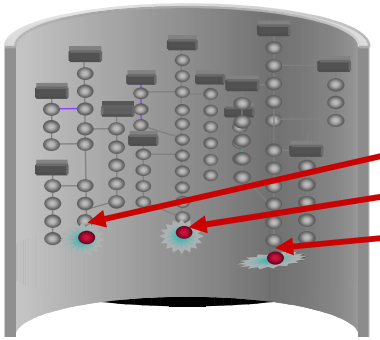
IBM Rational ClearCase

Manages assets

- Versioning: code, models, XML, HTML
- Parallel development

IBM Rational ClearQuest: Organized Activities

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



Change Set

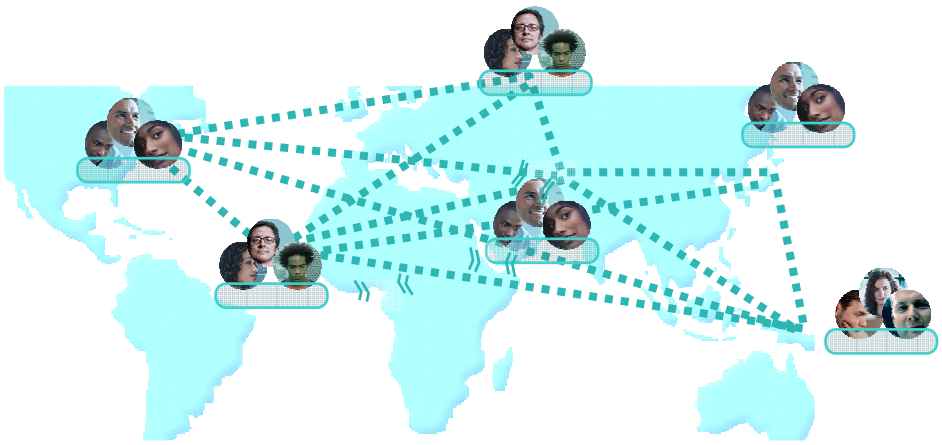
Special Promo

a. html	V5
b. xml	V3
c. jpg	V8

Manage Distributed Development

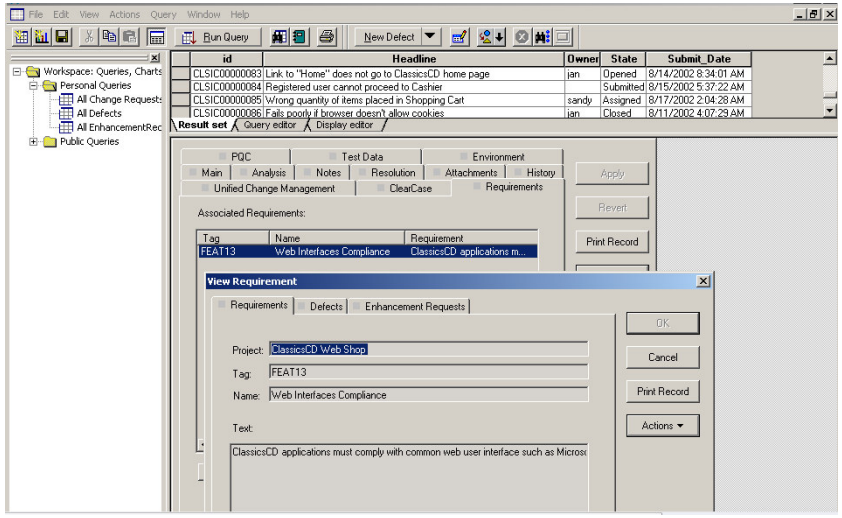
Rational CCM solutions provides a variety of ways to manage and deploy your distributed deployment environments.

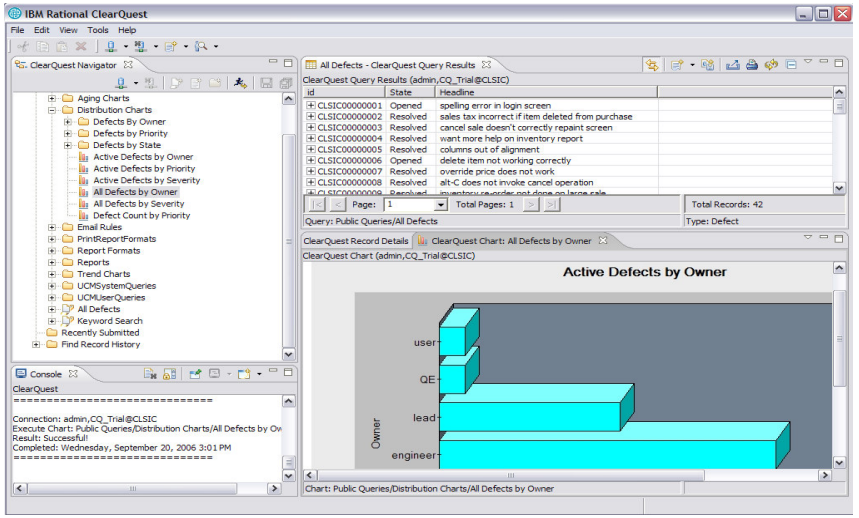
- ClearCase and ClearQuest Mulitsite
- ClearCase Web and ClearCase Remote Client (CCRC)
- ClearQuest Web

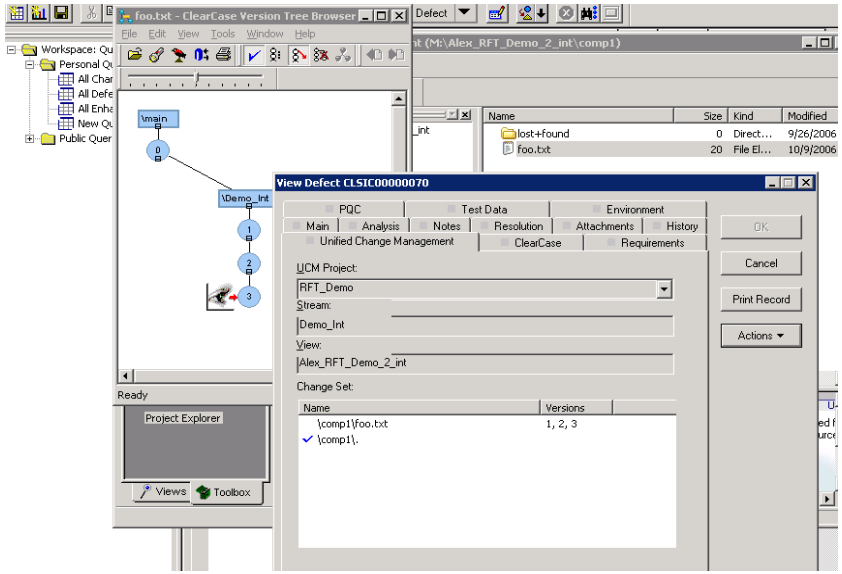


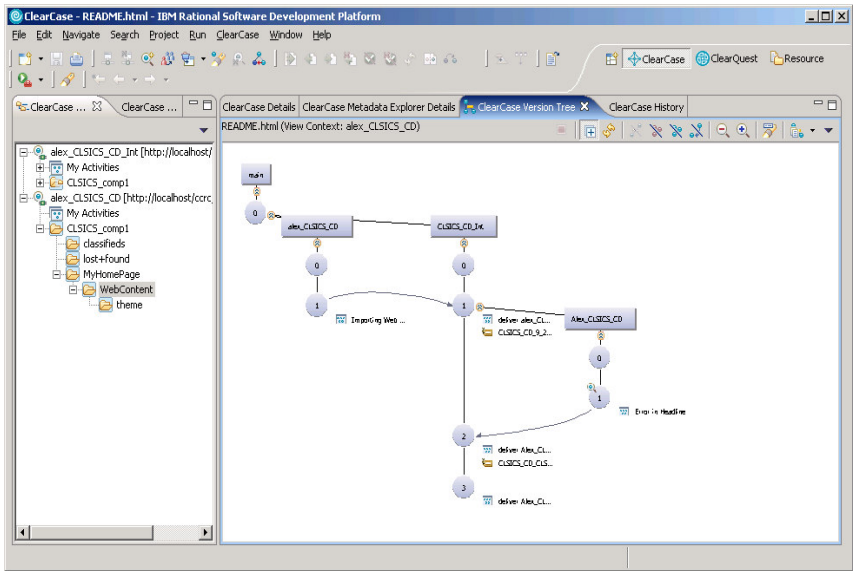
Rational CCM Enterprise wide management tools

Requirements, Change Sets, Build Information, Reporting all out of the box





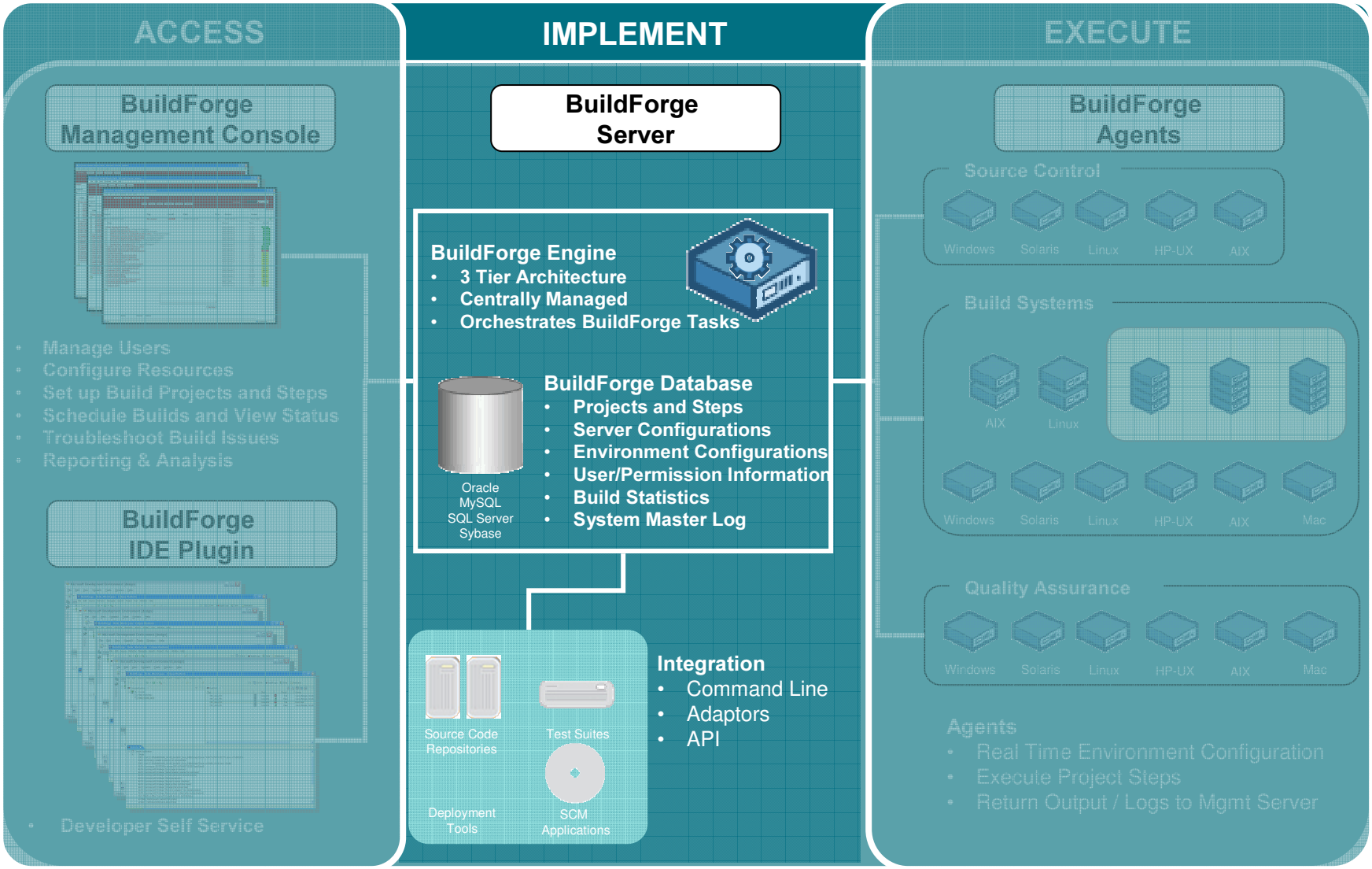




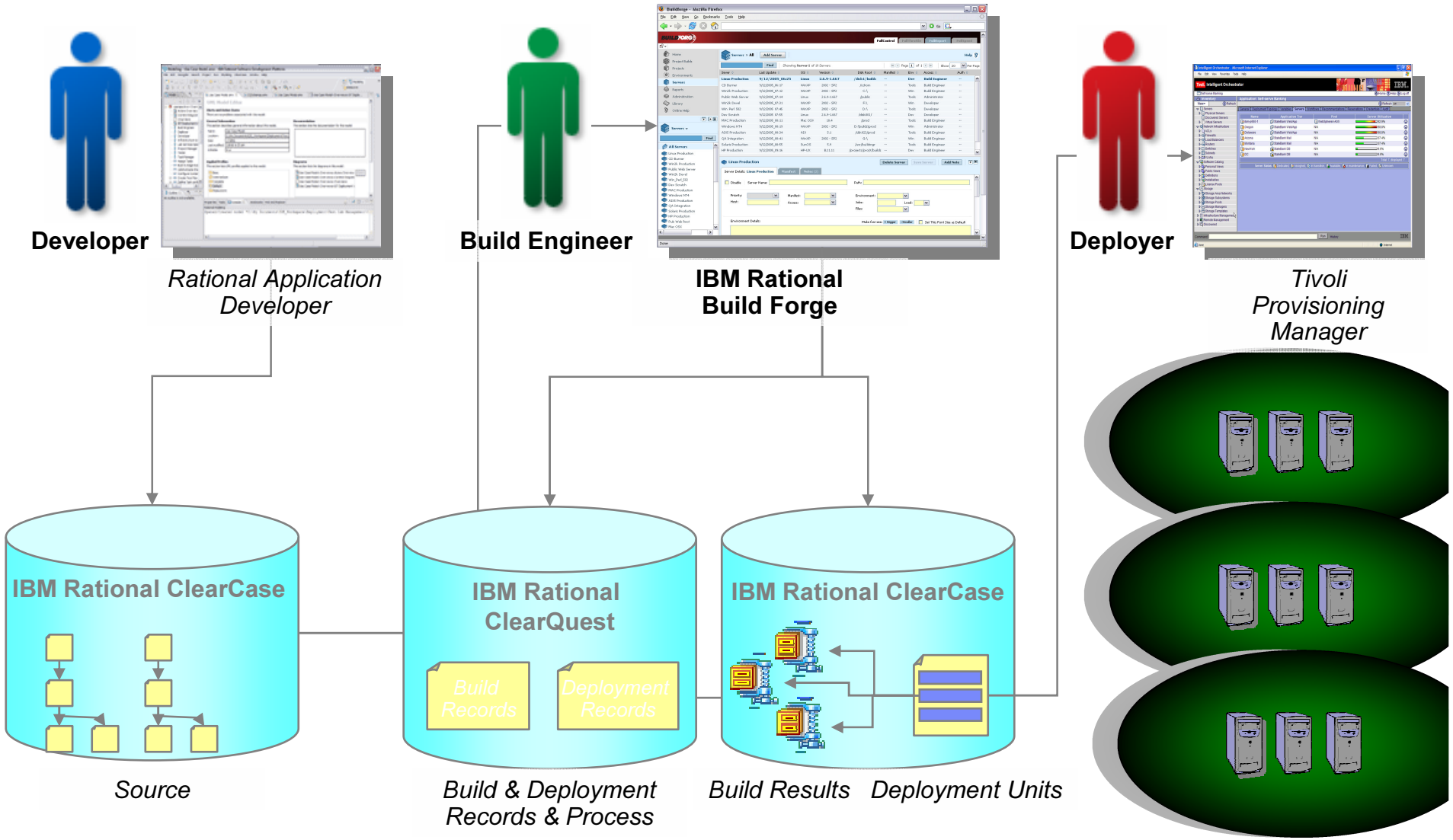
IBM Rational ClearCase Integrations:

- Rational ClearQuest
- Rational BuildForge
- Rational Rose
- Rational Functional, Manual, Performance Testers
- RequisitePro
- Microsoft VS*®
- Sybase PowerBuilder®
- Microsoft Word®

IBM Rational **BuildForge**: Functional Architecture



Build & deploy



Terms

Server

A Server is a logical resource in the BuildForge environment that represents any physical system running the BuildForge Agent.

A Server is defined within the BuildForge system with certain properties, such as a default path.

Project

A set of Steps which can be run in the BuildForge system. A project can be run repeatedly; each run generates a new Build.

Step

A component of a Project. A Step stores one or more commands which can be executed on a Server. Each command may itself launch an executable file, a batch file, or script that launches many other commands.

A command is anything that can be invoked from the command line of a given server (through an Agent) based on the security privileges configured.

Environments

The BuildForge system allows you to manage environment variables separate from your Projects, Servers, and Steps

- Define Environment Groups
  - Containing one or more Environment Variables
- You can assign Environment Groups to Servers, Projects, and Steps
  - At runtime, the system assembles the final working environment for a Step from all of the relevant Groups assigned to the Server, Project, and Step

Bill of Materials

- The BuildForge system generates a Bill of Materials (BOM) after each build
  - Build Results
  - Notes
  - Environments
  - List of build files
  - Code Changes
- The BOM contains information about the steps in the build and the changes to files that resulted from it.
- Uses of BOM:
  - Understanding the contents of a new build
  - Serve as an audit solution for your build and release process
  - Complete documentation of a build's contents.

Filtering

- BuildForge, by default, determines the success or failure of any command by the exit status it returns
  - zero as success
  - one as failure
- Certain commands always return a zero exit status
  - For example, a command like *net use* prints a list of mapped network drives; the command always succeeds although the list may not contain desired drives
- Filters are a set of regular expressions that are used to parse the output of a step command to determine success or failure

Terms

Dot (.) Commands

The BuildForge system includes a set of special commands called Dot Commands that typically can be used as the body of a Step.

The system intercepts commands that are preceded by a period and uses them to perform special functions within the BuildForge system.

Sampling of Commands Available

- .put
- .get
- .break
- .edit
- .load
- .lock
- .mkdir
- .monitor
- .include
- .strsub
- .retry
- .rget
- .rmdir
- .rput
- .scan
- .sleep

Notification

- E-mail notifications are always sent to Groups, not individual users

- Projects level Notification
  - Start
  - Pass
  - Fail
- Steps level Notification
  - Pass
  - Fail

Security

Concepts in the BuildForge security system:

- Users
- Access Groups
- Permissions
- Ownership

Security (cont'd)

- Role-based system
  - *Access Groups* represents a role a *User* has in organization
  - Roles have *Permissions* and *Ownership*
- User access is determined by the **union** of the Permissions of all groups the user belongs to
- Combination of *Permissions* and *Ownership* define what a group can do and/or see
  - To edit a give Project, a User would have to have *Ownership* on the Project AND *Permissions* to Edit Projects
- Example
  - User who is a member of the Guest group (and no other groups) sees only Projects which have the Guest group assigned as their Access property
  - User can only launch projects with Guest access

Ownership vs Permissions

Permissions

- System level
  - Add/Delete Projects
- Multiple Access Groups can have a single permission
  - Build Engineer & System Administrator can have a permission to edit Access Groups

Ownership

- Resource level
  - Projects, Steps, Environment Groups
- Only a Single Access Group can have ownership over a resource

Overview of Adaptor Configuration

- Define source code *Interfaces* for the systems you use
- Create *Links* between those interfaces and specific projects
- *Schedule* the projects to run, as often as you want your system to check for changes
- *Run* each project once

Chaining Projects

You can link or embed one Project within another Project in the BuildForge environment through a feature called **Chaining.**

Two Types of Chaining

- Inline Chaining
- Pass / Fail Chaining

Terms

Library Projects

From the point of view of the BuildForge system, a library project is simply a projects whose Server property is set to *None*.

These projects are intended to be chained within other projects and therefore use the server of the Step that calls them.

Server Pool

A Server Pool is a group of Servers with similar build properties (running the same operating system and with the same compilers available, for example).

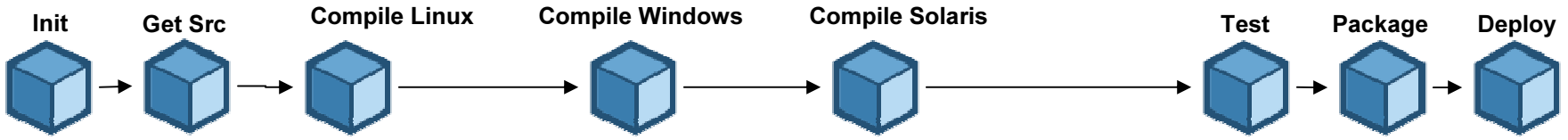
The BuildForge system can run a Project on a different Server in the same Pool when the default Server for the Project is busy.

Threading

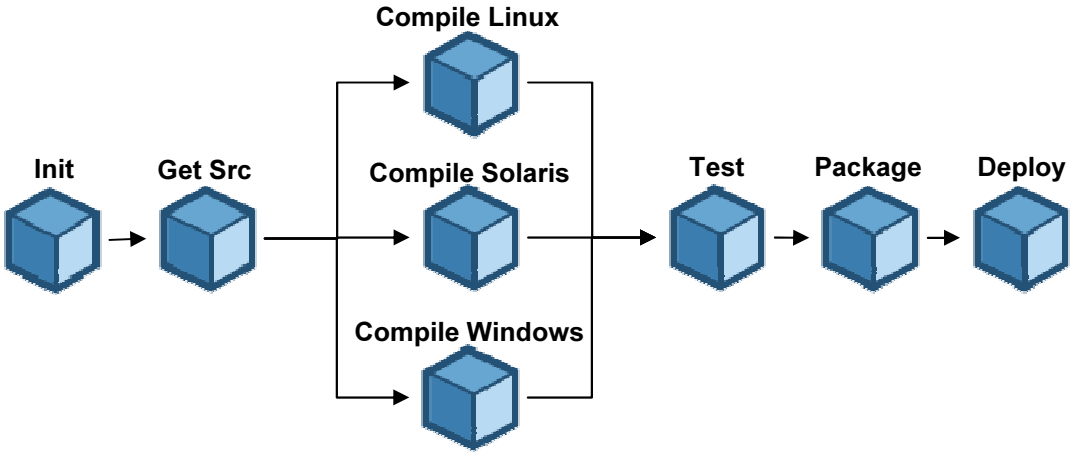
Threading allows for multiple Steps to run in parallel, thereby increasing the speed of your build.

Example

Without Threading



With Threading



Benefits – Server pooling

- System can switch Build to alternate Server if default server is down or busy
- System will distribute processing load across farm of Servers automatically
- System can run a single Step on several Servers, in parallel, using **Broadcasting**

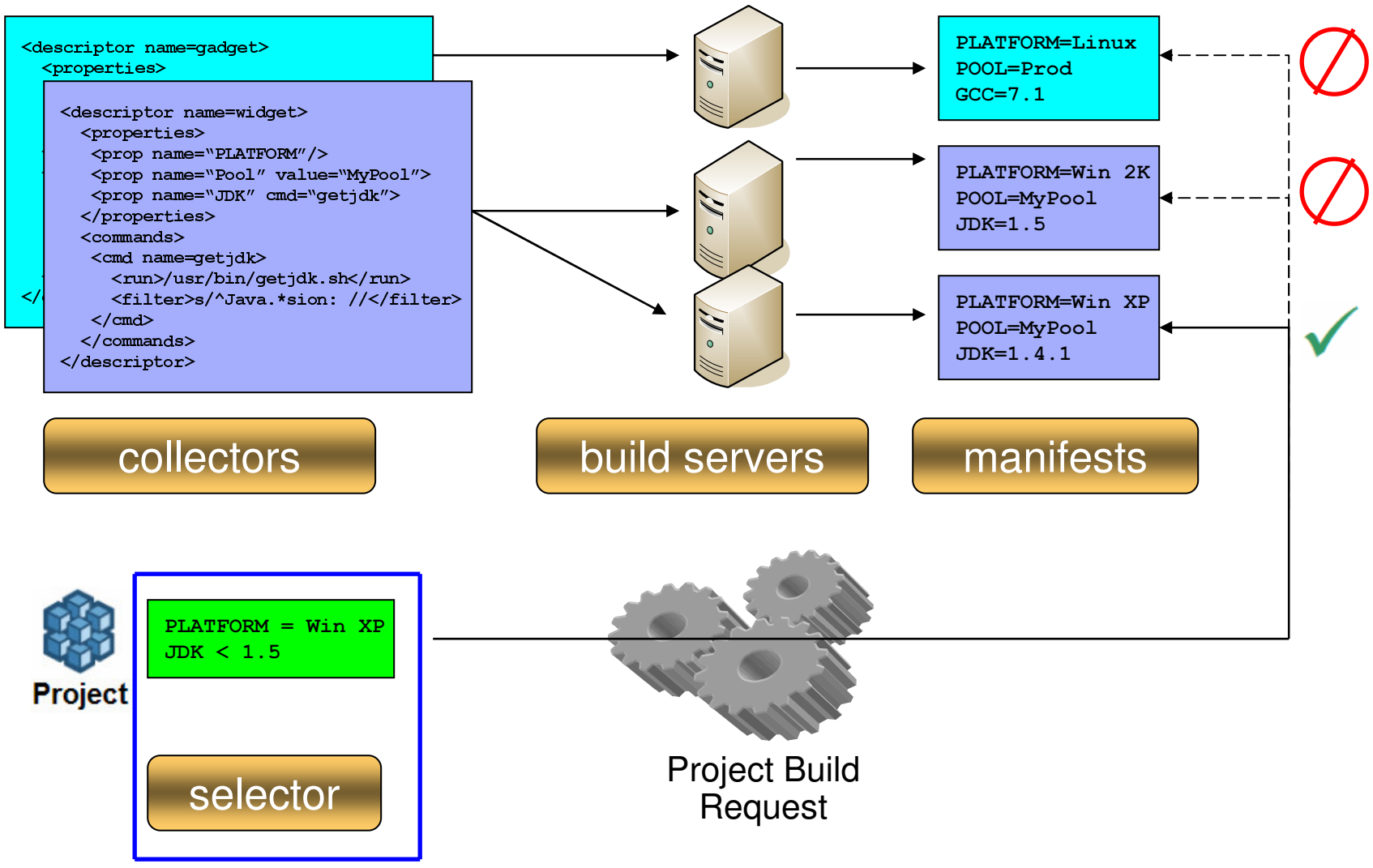
Advanced Build Management Features

- Dynamic Server Management
  - Dynamic Pooling
    - Logically group hardware based on user criteria- department, similar characteristics, etc.
    - Used for load balancing, fault tolerance, easier administration
  - Dynamic Server Allocation
    - Server inventory contains manifests- properties of a server used for dynamic selection
    - Optimally select build servers at execution time
      - Flexible selection criteria: can be general or detailed
    - Attribute types include: built-ins, static, dynamic
    - Support for user-defined types
    - Server manifest refresh on-demand or scheduled
    - Add new servers on network without having to manually configure or update any projects

Advanced Build Management Features (cont'd)

- Load Balancing
  - Control maximum number of jobs per server, per user
  - Utilize idle hardware for requests
- These advanced build management features introduced in 7.0 are available via Enterprise Edition only

Workflow Overview of Collectors / Selectors / Manifests




DEMO

Extreme Change Management

- Common, distributed and syncronized repository
- Common process and UI for heterogeneous platforms (integrated with IDEs)
  - MVS
  - Windows (VAJ – WSAD/RAD – WD/z – Eclipse – MS V* - WDSC)
  - Unix / Linux
- Ability to work on parallel Change Requests
  - Enhancement, Maintenance, Bugfixing
- Ability to rebase all parallel developments with production environment
- Ability to work on the same task/activity/request with multiple users
- Increase the level of automation for the SCM process
- High value functionalities for critical applications:
  - Impact analysis
  - Out-of-date mechanism for builds -> software consistency

Agenda

- Defining Change and Configuration management
- Business value of Change and Configuration management solutions
- Challenges-solutions in Change and Configuration management
- Capabilities of Rational Change and Configuration management tools
- BuildForge Demo
- ECM Demo
- Closing, Q&A and Thanks

For More Information…

- **IBM Rational Clearcase:**

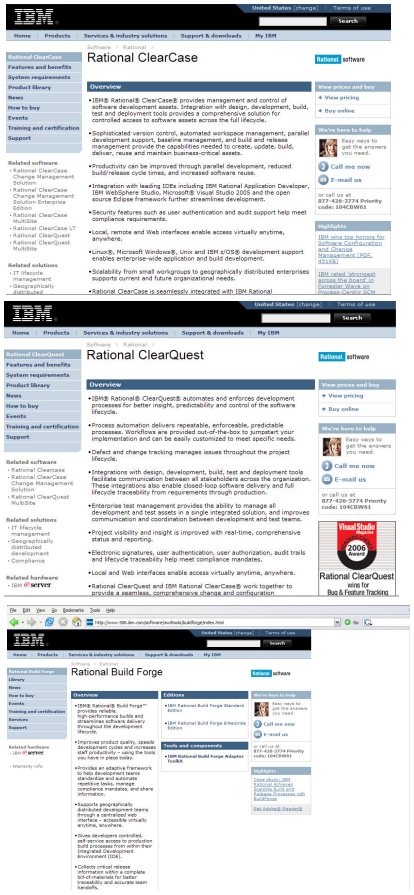
  http://www-306.ibm.com/software/awdtools/clearcase/

- **IBM Rational ClearQuest**:

  http://www-306.ibm.com/software/awdtools/clearquest/

- **IBM Rational BuildForge**:

  http://www-306.ibm.com/software/awdtools/buildforge/index.html



Additional resources

- Eclipse
  - http://www.eclipse.org
- IBM developerWorks for hints, tools, tips and tricks
  - http://www-106.ibm.com/developerworks/platform/
- Demos, evaluations, upgrades, patches, hot fixes, add-ins, plug-ins, models, scripts, and documentation
  - http://www-136.ibm.com/developerworks/rational/downloads/
- IBM Rational Application Developer
  - http://www-306.ibm.com/software/awdtools/developer/application/index.html

IBM Software

Development Platform

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