

IBM Rational Change Management Products

Highlights

IBM Rational change management products are designed to:

- *Manage change across the software life cycle—from design to code to test*
- *Quickly prioritize and track defects and change requests*
- *Simplify development with activity-based change management*
- *Improve team collaboration with out-of-the-box process automation and workflow management*
- *Enable parallel development*
- *Provide advanced workspace management*
- *Support asset-based development for software reuse*
- *Speed application delivery with advanced build and release management*
- *Provide real-time project status*
- *Support direct access to assets and changes from within leading integrated development environments (IDEs)*
- *Improve the ability to meet regulatory requirements with audit support*
- *Scale from small workgroups to geographically distributed enterprises*

IBM Rational® change management products, including IBM Rational ClearCase and IBM Rational ClearQuest, lead the software configuration management product market.* Part of the IBM Rational Team Unifying Platform™, a set of integrated tools that span the full application development life cycle, IBM Rational change management products enable you to effectively manage change and assets to help you deliver better applications faster and at lower cost. You can provide all your team members with instant, controlled access to the information they need to create, update, build, deliver, reuse and maintain the software assets critical to your business.

The IBM Rational ClearCase® family provides software asset management through features such as version control, baseline management, and build and release management. It consists of three key products: IBM Rational ClearCase LT, IBM Rational ClearCase and IBM Rational ClearCase MultiSite®.

The IBM Rational ClearQuest® family provides flexible defect and change tracking and automated workflow support. The two key products include IBM Rational ClearQuest and IBM Rational ClearQuest MultiSite.

*Worldwide Software Configuration Management Tools 2003 Vendor Shares." IDC #31689. August 2004.

IBM Rational Change Management Products

Product	Functionality	Team Type
IBM Rational ClearCase LT	Version control Automated workspace management Parallel development support Support for disconnected usage Local, remote and Web client access	Small to medium teams
IBM Rational ClearCase	Version control Automated workspace management Transparent, real-time access to files and directories Parallel development support Advanced build and release management Local, remote and Web client access	Medium to large teams
IBM Rational ClearCase MultiSite	Distributed development support for IBM Rational ClearCase Web-based administration Automatic backup and restore Data integrity	Geographically distributed teams
IBM Rational ClearQuest	Defect and change tracking Flexible, automated, customizable workflow support Local, remote and Web client access Integration with IBM Rational requirements management and test management tools for end-to-end change tracking and management	Small to large teams
IBM Rational ClearQuest MultiSite	Distributed development support for IBM Rational ClearQuest Data integrity	Geographically distributed teams

Together, the IBM Rational ClearCase and IBM Rational ClearQuest product families help deliver a comprehensive, flexible and scalable change management solution ideal for collaborative team environments and distributed groups.

Activity-based change management

In software development, it is not enough to capture change requests and track defects. A single change typically affects multiple assets—from design models to code to test scripts. Several team members may be involved in resolving a single application issue.

Rational ClearCase and Rational ClearQuest allow you to define and manage changes to software assets as activities. Through the Unified Change Management (UCM) capability included in Rational ClearCase and Rational ClearQuest, specific files in Rational ClearCase are associated with activities in Rational ClearQuest. Developers can then perform operations directly on the activities rather than on the collections of files associated with them. This process reduces build and integration errors caused by developers forgetting which files

they modified when delivering their changes. It also helps ensure that testing is performed against the appropriate activities.

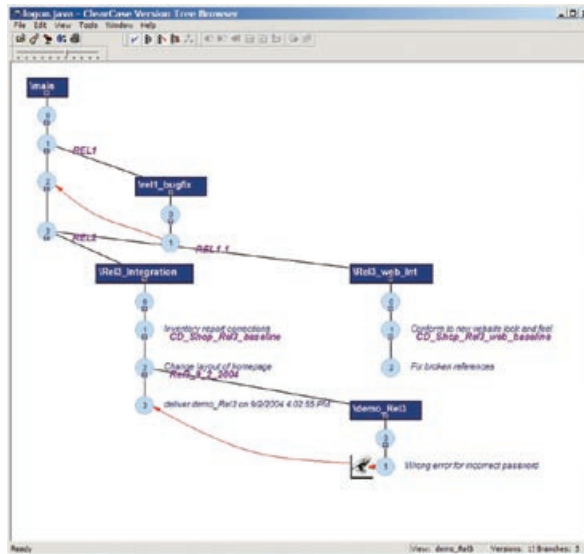
Managing activities instead of their related assets within the context of the overall development process provides greater clarity and insight. It can streamline and simplify the development process, allowing development teams to work together more efficiently. With this more holistic approach, team members including project leaders, analysts,

developers, testers and customer support personnel can communicate more effectively. Project managers can more easily manage and track the status of proposed changes, understand the impact of proposed changes to a project and make more informed decisions about resource allocation and project timetables.

Workflow management

Rational change management products provide flexible, automated workflows that consistently enforce your development process and help ensure that your extended development team is tied into that process. You can immediately implement and automate your development workflow using the UCM capability out-of-the-box, or you can customize the workflow to meet your unique, specialized project needs. From submitting change requests to assigning those requests to resolving and verifying changes, you have full control over how each change is managed and implemented. Rational change management products give you the ability to:

- *Define a process with actions and states*
- *Collect the right data with mandatory fields and pick lists*
- *Assign ownership of a task to an individual*
- *Provide e-mail notification of changes to improve response time to changes*



Rational ClearCase version trees provide a visual history of parallel development branches

- *Aggregate duplicate defects into a single defect*
- *Split complex enhancement requests into multiple activities*
- *Monitor project progress with queries, reports and charts*

Parallel development

The Rational ClearCase family provides extensive support for parallel development, allowing developers to work on the same code or release, more easily resolve conflicts and reduce confusion, and get more done in a shorter amount of time. Supporting parallel development requires balancing the need developers have to work independently with the need to integrate the work of individual developers with the work of the rest of the team. The development and integration stream model in Rational ClearCase products achieve this balance by providing private developer workspaces as well as public integration areas.

Key capabilities that help enable parallel development include:

- *Easy identification of exactly what changes have to be merged in a given release*
- *Effective development and integration of stream models that define how and when developers deliver code changes*
- *Branching and merging capabilities that support the isolation of specific changes or versions and the integration of changes into releases*
- *Advanced diff/merge technology that visually highlights conflicts for easy resolution*
- *Automatic, selective, subtractive and directory options for merging*
- *Options for Rational ClearCase MultiSite and Rational ClearQuest MultiSite that provide virtual teams with the experience of working at a single site*

Access anywhere at any time

Rational change management products provide options for easy access from the environments and locations in which your team works. From desktop clients to remote and Web clients to integrated IDE access, Rational change management products enable development teams to capture, control and securely manage software assets and changes.

Desktop clients provide complete Rational change management functionality in a flexible Microsoft® Windows® interface. Customizable menus and toolbars allow users to tailor the interface so they have fast access to the functions they need. In addition, the Rational ClearCase Remote Client feature enables remote developers to access versioned objects in a centralized repository via a wide area network (WAN). The client also can stand alone or act from within the open source Eclipse framework. This capability helps to ensure that all team members, local and remote, will always have access to the most up-to-date change management information available—improving team communication and collaboration and contributing to a higher-quality product.

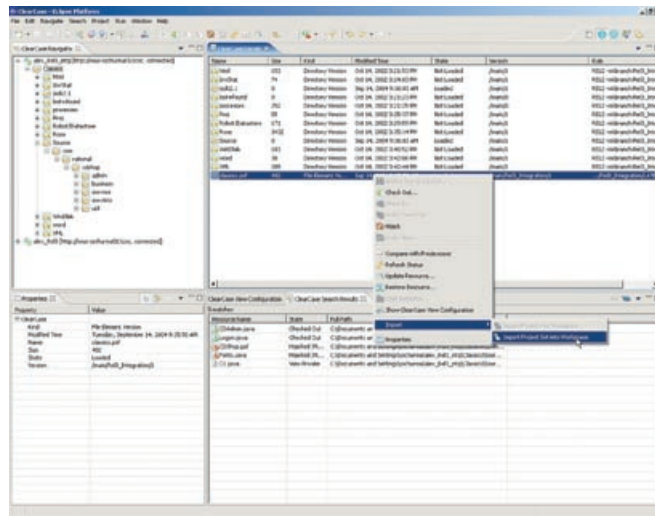
Web clients provide access to Rational change management capabilities in an easy-to-use browser-based interface. The Rational ClearCase

Web interface gives your team instant access to standard version control commands, such as check-in and check-out. It also provides everyone on the team with the ability to view and update information on change requests—such as who they are assigned to, what work is being done on them and when changes are being made to them. Team members can also add comments to an existing defect or submit new enhancement requests. This ability to view and update information on change requests can enable the team to stay in sync as the project progresses.

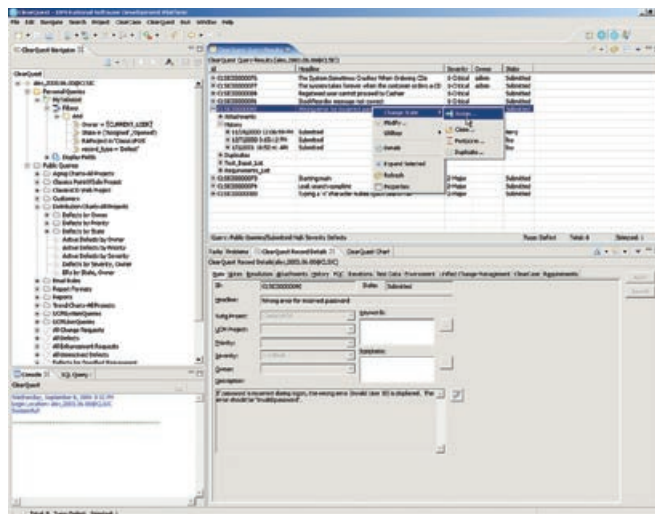
The Rational ClearCase TSO Client feature provides support for organizations developing their applications on the IBM z/OS® platform, allowing them to develop in their native time-sharing option/interactive system productivity facility (TSO/ISPF) environment and store their assets in a ClearCase repository running on a distributed platform (Windows, UNIX or Linux).

Direct access from leading IDEs

Developers prefer to work within their chosen development environments. Rational ClearCase products provide deep integration with leading IDEs, including IBM Rational Application



Local and remote developers can easily join a project, access files and view change information



Developers can easily track defects and changes

Developer for WebSphere Software, IBM WebSphere® Studio Application Developer, the open source Eclipse framework and Microsoft Visual Studio® .NET, enabling developers to perform common change management operations without leaving their IDE. Via toolbars or right-clicking, developers can access change management functions including check-in/check-out, deliver and rebase. And unlike other IDE integrations, the defect and change tracking capabilities of Rational ClearQuest are also available from within your IDE, helping you easily run queries and submit defects.

Heterogeneous platform support

Rational change management products provide flexibility for developers and IT managers alike. On the client side, you can develop in virtually any development environment, including the Windows, Linux®, UNIX® and z/OS platforms. On the server side, you can choose from a wide variety of supported platforms to store your assets while your development teams work in their preferred development environments. For example, using Linux to store your software assets on the server side can help reduce total cost of ownership for software development. Platform flexibility can reduce administration costs and enable development teams to easily collaborate regardless of their individual development tools.

Integrated life cycle support

Rational change management products provide deep integration with development and team products. In addition to integration with leading IDEs, Rational change management products manage relationships between assets. For example, architects and developers can easily keep designs, visual models, generated code and related assets in sync.

For team support, integration with IBM Rational Team Unifying Platform and IBM Rational Suite® provides full life cycle support across development disciplines. You can manage assets from requirements through test and alert team members to the impact of change. For example, when a requirement changes, test engineers can automatically be notified if a related test case needs to change.

Project management integrations include support for Microsoft Project so you can associate and synchronize project plan tasks with enhancement requests and other change requests. Project-wide measurement support is also available via the Rational Team Unifying Platform ProjectConsole feature, which is integrated with Rational ClearCase and Rational ClearQuest. These integrations enable you to view and analyze overall project trends using real data from multiple development tools.

The Rational ClearCase and Rational ClearQuest application programming interfaces (APIs) also provide an open, extensible way to meet your specific integration needs.

IBM Rational ClearCase

Advanced version control

Rational ClearCase versions source code, libraries, compilers, visual models, design notes, documentation, binaries, Web artifacts, test suites, databases and any other project artifact that can be represented as digital content, including text and non-text files, directories and links. Rational ClearCase also provides versioning of directories, subdirectories and all file system objects. Developers can see the version, branch and file they are working on by simply viewing the Rational ClearCase version tree—accessible at any time via the ClearCase Explorer or from within popular IDEs.

Rational ClearCase uses a check-out/edit/check-in paradigm similar to the model featured in many traditional version control tools. Users check out the files they need to work on, edit them and then check in the new versions. ClearCase also offers access to more advanced functions, allowing you to delete previous versions, create and delete branches, list version histories, and compare and merge versions.

Overview of the IBM Rational Change Management Products

Features	IBM Rational ClearCase LT	IBM Rational ClearCase	IBM Rational ClearQuest	IBM Rational ClearCase MultiSite option	IBM Rational ClearQuest MultiSite option
Asset Management					
Version control including directory versioning	x	x			
"Snapshot" or sandbox-based views	x	x			
Promotion model support	x	x			
Dynamic views		x			
Parallel development support	x	x			
Activity-based change management and change sets	x	x	x		
Web client access	x	x	x	x	
WAN access	x	x	x	x	x
IDE integration (Rational Developer products, Microsoft .NET, Eclipse and more)	x	x	x		
Windows/UNIX interoperability	x	x	x	x	
Common object model (COM) API development support	x	x	x		
Detailed build auditing		x			
Binary sharing		x			
Build dependency automation		x			
Distributed builds (UNIX, z/OS)		x			
Parallel builds (Windows, UNIX, z/OS)		x			
Web-based administration				x	
Distributed servers		x		x	x
Network attached storage devices		x		x	x
Repository/database replication and synchronization				x	x
Defect and Change Request Tracking					
Change workflow automation and process enforcement			x		
E-mail notification/e-mail reader			x		
Easy-to-build queries			x		
Metrics support (charting and reporting)			x		
Secure access to data	x	x	x		
Process designer and policies	x	x	x		
Customization with Visual Basic and Perl scripting support	x	x	x		

Advanced build management

Effective build management focuses on two issues: streamlining the edit-build-debug cycle and accurately reproducing software versions. While Rational ClearCase is compatible with traditional build scripts, native Windows and UNIX make utilities and z/OS build facilities, it also offers upward-compatible build utilities that have clear advantages. By automatically detecting dependencies, reusing derived objects wherever possible and producing detailed build audit trails, Rational ClearCase optimizes build times while helping to ensure the reproducibility of software versions.

Rational ClearCase includes the clearmake and omake build programs. These build utilities facilitate functions such as configuration lookup, binary sharing, parallel and distributed builds and build auditing. You also can generate a detailed bill of materials (configuration records). These configuration records can be used to determine when derived objects can be shared by developers using multiple views. This facility, termed wink-in, saves both disk storage space and build time.

Support for mainframe development

For organizations developing and supporting applications using heterogeneous platforms, Rational ClearCase supports build development of z/OS applications. With the

Rational ClearCase remote build capability, you can submit build requests from any supported client to compile source code on the z/OS platform. You can also configure the remote build capability to return the derived objects, such as load modules and listings to be versioned within Rational ClearCase. Rational ClearCase also provides comprehensive reports about the set of versioned files that comprise each remote build. This information enables you to recreate builds on demand.

In addition, z/OS developers can access ClearCase facilities from a native TSO/ISPF client, from a native desktop client or from within their IDEs.

Workspace management

Rational ClearCase gives developers fine-grained control over their personal workspaces and provides seamless access to the exact file and directory versions the developers need to work on. Rational provides two types of views that support networked/remote and local usage models, respectively:

- *Dynamic views provide transparent access to any version of any element from anywhere on the network*
- *Snapshot views provide the flexibility to use local copies of file versions while disconnected from the network and the ability to easily synchronize changes when reconnected to the network*

Development teams can mix and match dynamic and snapshot views based on their preferences and project needs. Dynamic views are useful on highly distributed projects and are required for build management tasks, including build auditing. Snapshot views, used on large and small projects alike, are particularly useful for remote development work and for prototyping or early stage projects.

Asset-based development

Software industry experts estimate that the cost to reuse a software component is 20 percent of the cost of new development, yet there are many obstacles to successful reuse. As development activities become more distributed, the challenge for architects and developers lies in knowing what assets exist, where they reside and how to categorize and reference them in design and development activities.

Rational ClearCase helps enable effective software reuse in many organizations. IBM supports the Reusable Asset Specification (RAS), which defines a standard way to package reusable software assets. The integration between Rational Software Architect, Rational Rose® XDE™ Developer and Rational ClearCase provides development teams with the ability to search, locate, download and apply assets from reusable asset repositories located locally or on the Web.

Rational ClearQuest

Easily adapt to the way you work

Rational ClearQuest provides flexible defect and change tracking across the development life cycle. Customizable, automated workflows based on software development best practices consistently enforce the development process. Rational ClearQuest also improves communication and collaboration among virtual team members by helping ensure that the extended development team is tied into the correct process.

Workflow support includes notification options so your team members can keep informed as change requests are updated. You can also define unique workflows for each type of change request or for different projects. Any changes or updates made to your change processes are automatically propagated to all Rational ClearQuest client interfaces.

IBM Rational ClearQuest provides visual defect and change tracking information so you can easily monitor trends

ClearQuest workflows also easily adapt to your processes and process maturity. Fields can be added, pick lists can be modified and required fields can be identified easily through ClearQuest Designer. Additionally, as the process matures, new states can be added to reflect new steps in your process. Help information on your process can also be added to give users company-specific, context-sensitive help.

Measuring progress and reporting

Rational ClearQuest gives you control and insight into your development process with comprehensive support for queries, extensive charting and reporting. Distribution, trend and aging charts help you visualize complex change-related data. Individual team members can also gain quick access to their prioritized development activities by generating to-do lists, and they can run reports out-of-the-box using

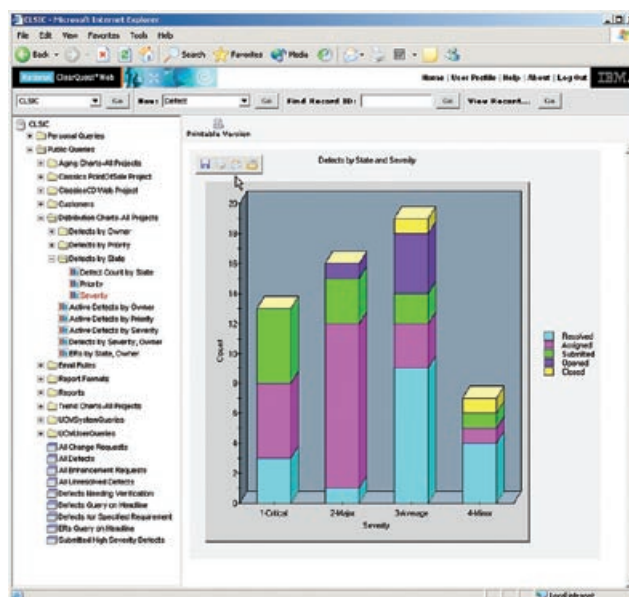
Business Objects Crystal Reports software. More advanced reports can be authored using Crystal Reports Professional Edition*.

Rational ClearCase LT

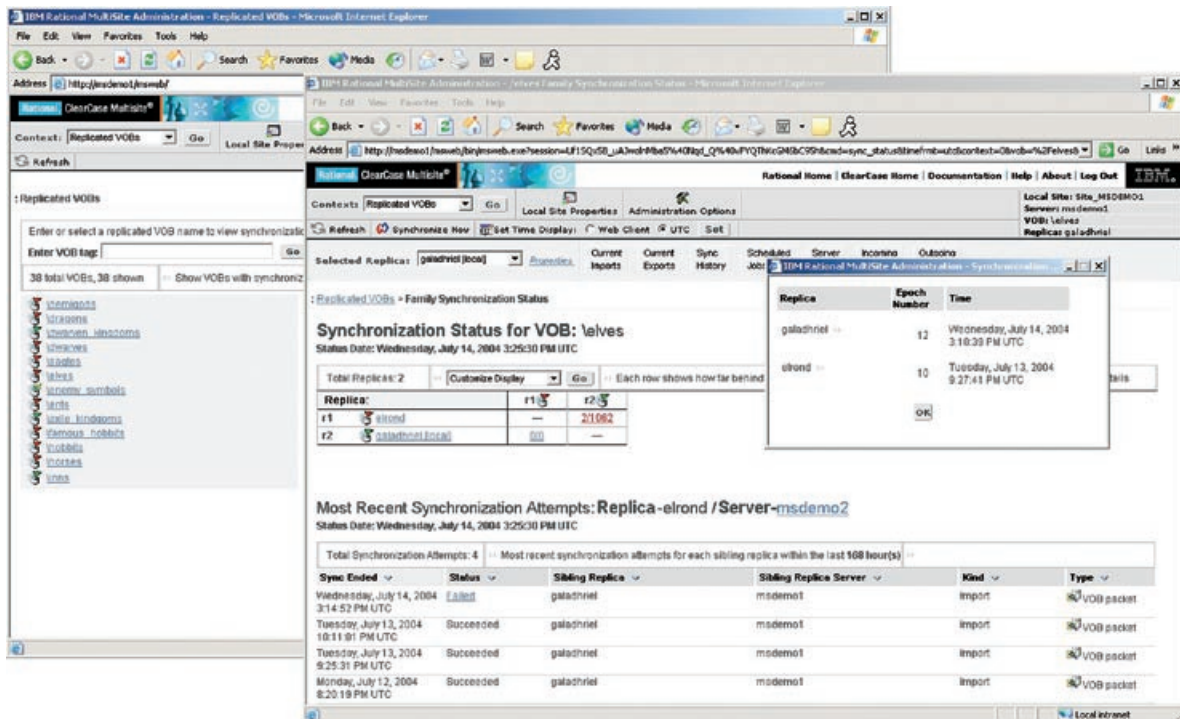
Rational ClearCase LT is a single-server version of Rational ClearCase that provides version control, UCM support, snapshot views and support for disconnected usage. Ideal for small departmental teams and projects, Rational ClearCase LT is an integral part of the Rational Team Unifying Platform and is included with IBM Rational Developer, Architect and Tester products and WebSphere Studio Application Developer.

Rational ClearCase MultiSite and Rational ClearQuest MultiSite

Geographically distributed teams are the norm in most global enterprises today. Rational ClearCase MultiSite and Rational ClearQuest MultiSite provide Rational ClearCase and Rational ClearQuest users with distributed development support, including replication and synchronization of development assets and changes. Ideal for software teams that span multiple locations and



*Rational ClearQuest integrates with Crystal Reports Professional Edition for advanced reporting capabilities.



Via the Web, administrators can easily initiate and monitor the synchronization between Rational ClearCase repositories from wherever they may be located

time zones while working on common projects, Rational ClearCase MultiSite and Rational ClearQuest MultiSite are most commonly used in the following situations:

- Project teams that build and maintain large-scale systems at multiple sites
- Porting, localization and customization teams that work in separate facilities
- Licensees and original equipment manufacturers that prepare and distribute custom versions of standard products
- Acquired development organizations and partners who coordinate work with a central integration team
- Software release and standardization teams that share assets across groups

These Rational products help maintain data integrity through automatic replication of project repositories between geographically distributed sites, resending information in the event of network failure and automatically recovering repositories in the event of system failure.

Efficient transmission of incremental changes that appear in Rational change management repositories reduce network strain and improve performance. Mastership capabilities prevent changes made at one site from being overwritten by changes made at other sites.

Additionally, Rational ClearCase MultiSite features an easy-to-use browser-based interface that allows administrators to manage all replicas from their local site. Using the MultiSite Administration Console feature, administrators can:

- Access Rational ClearCase repository and server information (including scheduled jobs, packets in shipping bays, server logs and synchronization history)
- Initiate a synchronization between Rational ClearCase repositories
- Generate and view synchronization status
- Create, schedule and modify properties of a scheduled job

IBM Rational change management products at a glance

IBM Rational ClearCase LT

Server Platforms:

- Microsoft® Windows® XP
 - Microsoft Windows 2000
 - Microsoft Windows NT®
 - Microsoft Windows Server™ 2003
 - Hewlett-Packard HP-UX
 - IBM AIX 5L™
 - Red Hat Linux
 - SuSE Linux
 - Sun Solaris®
-

Web Servers:

- Rational Web Platform
-

Client Platforms:

- Microsoft Windows XP
 - Microsoft Windows 2000
 - Microsoft Windows NT
 - Microsoft Windows Server 2003
 - Hewlett-Packard HP-UX
 - IBM AIX 5L
 - Red Hat Linux
 - SuSE Linux
 - Sun Solaris
-

Web Browsers:

- Microsoft Internet Explorer
 - Mozilla
 - Netscape Navigator
-

Integrations:

- IBM Rational Web Developer for WebSphere Software
 - IBM Rational Application Developer for WebSphere Software
 - IBM Rational Software Architect
 - IBM Rational Software Modeler
 - IBM Rational Functional Tester
 - IBM Rational Performance Tester
 - IBM WebSphere Studio Site Developer
 - IBM WebSphere Studio Application Developer
 - IBM WebSphere Studio Application Developer Integration Edition
 - IBM WebSphere Studio Enterprise Developer
 - Eclipse
 - Microsoft Visual Studio .NET (C#, J#, C++, VB)
 - Microsoft Visual Studio 6 (C++, J++, VB)
 - Microsoft Excel, Word, FrontPage®, PowerPoint®
 - Oracle JDeveloper
 - IBM VisualAge® for Java™
 - Sun Forte Developer for Java and C++
 - Sun Java Studio
 - Sybase PowerBuilder
 - Borland JBuilder
 - All Sustainable Computing Consortium (SCC)-compliant tools
-

IBM Rational ClearCase

Server Platforms:

- Microsoft Windows XP
 - Microsoft Windows 2000
 - Microsoft Windows Server 2003
 - Microsoft Windows NT
 - Hewlett-Packard HP-UX
 - IBM AIX 5L
 - Red Hat Linux
 - Red Hat Linux on zSeries®
 - SuSE Linux
 - SuSE Linux on zSeries
 - Sun Solaris
 - SGI IRIX
-

Web Servers:

- Rational Web Platform
-

Client Platforms:

- Microsoft Windows XP
 - Microsoft Windows 2000
 - Microsoft Windows Server 2003
 - Microsoft Windows NT
 - Hewlett-Packard HP-UX
 - IBM AIX 5L
 - Red Hat Linux
 - Red Hat Linux on zSeries
 - SuSE Linux
 - SuSE Linux on zSeries
 - Sun Solaris
 - SGI IRIX
 - IBM z/OS
-

Web Browsers:

- Microsoft Internet Explorer
 - Netscape Navigator
 - Mozilla
-

IBM Rational change management products at a glance (continued)

IBM Rational ClearCase (continued)

Integrations:

- IBM Rational Web Developer for WebSphere Software
 - IBM Rational Application Developer for WebSphere Software
 - IBM Rational Software Architect
 - IBM Rational Software Modeler
 - IBM Rational Functional Tester
 - IBM Rational Performance Tester
 - IBM WebSphere Studio Site Developer
 - IBM WebSphere Studio Application Developer
 - IBM WebSphere Studio Application Developer Integration Edition
 - IBM WebSphere Studio Enterprise Developer
 - Eclipse
 - Microsoft Visual Studio .NET (C#, J#, C++, VB)
 - Microsoft Visual Studio 6 (C++, J++, VB)
 - Microsoft Excel, Word, FrontPage, PowerPoint
 - Oracle JDeveloper
 - IBM VisualAge for Java
 - Sun Forte Developer for Java and C++
 - Sun Java Studio
 - Sybase PowerBuilder
 - Borland JBuilder
 - All SCC-compliant tools
-

IBM Rational ClearQuest

Server Platforms:

- Microsoft Windows XP
 - Microsoft Windows 2000
 - Microsoft Windows Server 2003
 - Microsoft Windows NT
 - Hewlett-Packard HP-UX
 - IBM AIX 5L
 - Red Hat Linux
 - SuSE Linux
 - Sun Solaris
-

Web Servers:

- Rational Web Platform
 - IBM WebSphere Application Server
-

Client Platforms:

- Microsoft Windows XP
 - Microsoft Windows 2000
 - Microsoft Windows NT
 - Hewlett-Packard HP-UX
 - IBM AIX 5L
 - Red Hat Linux
 - SuSE Linux
 - Sun Solaris
 - Citrix MetaFrame
 - Apple Mac OS X
-

Web Browsers:

- Microsoft Internet Explorer
 - Netscape Navigator
 - Mozilla
 - Apple Safari
-

Databases:

- IBM DB2
 - IBM DB2® Express
 - IBM DB2 on zSeries
 - IBM DB2 Universal Database™ for Rational
 - Oracle
 - Microsoft SQL Server
 - Sybase SQL Anywhere
 - Microsoft Access
-

Integrations:

- IBM Rational Web Developer for WebSphere Software
 - IBM Rational Application Developer for WebSphere Software
 - IBM Rational Software Architect
 - IBM Rational Software Modeler
 - IBM Rational Functional Tester
 - IBM Rational Performance Tester
 - IBM WebSphere Studio Site Developer
 - IBM WebSphere Studio Application Developer
 - IBM WebSphere Studio Application Developer Integration Edition
 - IBM WebSphere Studio Enterprise Developer
 - Eclipse
 - Microsoft Visual Studio .NET (C#, J#, C++, VB)
 - Microsoft Visual Studio 6 (C++, J++, VB)
 - Microsoft Project
 - IBM Rational TestManager
 - IBM Rational RequisitePro®
 - IBM Rational PurifyPlus™
 - Microsoft Visual SourceSafe
 - Business Objects Crystal Reports
 - IBM Rational SoDA®
-

IBM Rational change management products at a glance (continued)

IBM Rational ClearCase MultiSite

Server Platforms:

- Microsoft Windows XP
- Microsoft Windows 2000
- Microsoft Windows Server 2003
- Microsoft Windows NT
- Hewlett-Packard HP-UX
- IBM AIX 5L
- Red Hat Linux
- Red Hat Linux on zSeries
- SuSE Linux
- SuSE Linux on zSeries
- Sun Solaris
- SGI IRIX

IBM Rational ClearQuest MultiSite

Server Platforms:

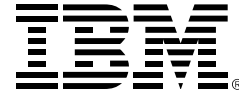
- Microsoft Windows XP
- Microsoft Windows 2000
- Microsoft Windows Server 2003
- Microsoft Windows NT
- Hewlett-Packard HP-UX
- IBM AIX 5L
- Red Hat Linux
- SuSE Linux
- Sun Solaris

Databases:

- IBM DB2
 - Microsoft SQL Server
 - Oracle
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For more information

To learn more about how IBM Rational change management products can help manage change and complexity, visit: ibm.com/software/rational/offerings/scm.html



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