



Rational. software

Integrated SCM for Rational Developer products and Eclipse

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Introduction

Software development is an increasingly complex and dynamic activity. Development frequently occurs in teams that perform parallel development on the same application, often in geographically distributed locations. Multiple versions of applications need to be supported, and they often must run on different machines and operating systems.

Increased economic pressures, auditory and regulatory compliance mandates and development process and technology complexity further intensify today's software development challenges. As a result, many problems can occur during software development, including:

- *Bugs that have been corrected reappear*
- *Previous releases of software are impossible to find or cannot be rebuilt*
- *Files mysteriously change or disappear altogether*
- *Work from one developer is replaced (lost) by work from another developer*
- *Builds that previously worked suddenly break*
- *Development team workload cannot be easily tracked*
- *Project status cannot be easily monitored and assessed*
- *It is difficult to determine what bugs have been fixed in a release and what code changes were made to fix those bugs*

How can these problems be reduced—or even eliminated? The answer is software configuration management, or SCM. In this paper, you will discover the key reasons why software configuration management is critical for business success. The paper discusses how IBM® Rational® ClearCase® and IBM Rational ClearQuest® change management solutions provide advanced SCM capabilities that can increase productivity, improve software quality and deliver maximum business value. It explains how Rational ClearCase and Rational ClearQuest are integrated with Rational Developer products, including IBM Rational Application Developer for WebSphere Software and IBM Rational Web Developer for WebSphere Software, as well as with the open source Eclipse framework for seamless access to SCM capabilities from within your integrated development environment (IDE). This paper also presents best practices for using Rational ClearCase and Rational ClearQuest from within Rational Developer products and Eclipse to enable more efficient development.

Why software configuration management?

Software configuration management (SCM) helps to establish and maintain the integrity of software products throughout the development life cycle. Through capabilities such as version control, build management, defect and change tracking, release management and process control, SCM can help deliver:

- *Increased productivity through parallel development and automated processes*
- *Better operational efficiency through improved team communication and collaboration, support for large distributed teams, enhanced reliability and minimized downtime*
- *Reduced cost through the leveraging of existing investments and increased software reuse*
- *Faster time-to-market through streamlined development and reduced release/build cycle times*
- *Enhanced software quality by preventing users from making mistakes and reducing bugs in delivered code*
- *Increased ability to meet compliance requirements with a well-defined, repeatable, auditable process*

“The integration of Rational ClearCase and Rational Application Developer for WebSphere Software allows for better productivity. From the learning curve perspective, it seems like one application. You don’t have to learn two full-blown applications. By having everything in one application, developers can get up to speed very quickly. This allows our developers to get back to what they do best, which is developing code—not learning the application software.”

—The Revere Group

By protecting and managing business-critical software assets and by automating and enforcing the development process, SCM tools can help enable development teams to produce higher-quality software faster and with lower cost and risk. The key is to implement SCM tools that can easily integrate with existing systems and development environments.

Improve productivity and gain long-term value with industry-leading SCM solutions

IBM Rational change management products, including IBM Rational ClearCase and IBM Rational ClearQuest, lead the SCM tools market.¹ 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 deliver proven technology to help developers and project managers effectively manage change and assets.

¹ Melissa Webster. “Worldwide Software Configuration Management Tools Competitive 2003 Vendor Shares.” IDC #31689. August 2004.

Going well beyond software revision control and versioning capabilities, Rational ClearCase and Rational ClearQuest deliver advanced SCM capabilities that provide development team members with instant, controlled access to the information they need to create, update, build, deliver, reuse and maintain business-critical software assets that can be developed faster and at lower cost.

Rational ClearCase: So much more than version control

Rational ClearCase products provide an extensive range of software asset management capabilities. From IBM Rational ClearCase LT to IBM Rational ClearCase to IBM Rational ClearCase MultiSite® change management solutions, organizations can choose the Rational ClearCase product that best meets their development needs.

Rational ClearCase LT provides version control for small to midsize collocated teams. Easy to install and manage, Rational ClearCase LT offers:

- *Version control for files, directories or other assets produced during the development life cycle, with annotated histories of source code, binaries, executables, documentation, test suites, libraries and Web elements.*
- *Automated workspace configuration with snapshot views. These views give easy access to the correct versions of files and directories required to complete a specific task while shielding team members from potentially destabilizing changes being made by other developers. This is done by loading the required versions of files and directories onto the developer's desktop—a feature ideally suited to disconnected users and early-stage projects that require isolation*
- *Parallel development support, including automatic branching to enable multiple development teams to work independently from the same code base, and proven diff/merge technology that automatically accepts uncontested changes and highlights conflicting changes for fast resolution.*
- *Remote client interface enables remote developers to access versioned objects in a centralized repository via a wide-area network (WAN) or a virtual private network (VPN) connection. The remote client interface uses automatic update technology (based on the Eclipse Update Manager technology) to allow users and administrators to manage the updates of many clients by simply pointing at the server's URL and auto-updating the client with new versions.*
- *Web interface offers easy access from standard Web browsers virtually anytime, anywhere.*

- *Tight integration with Rational ClearQuest provides smooth access to workflow management and change and defect tracking.*
- *Wide operating system support includes support for Linux[®], Microsoft[®] Windows[®] and UNIX[®] operating systems.*
- *Easy installation is the result of intuitive startup wizards to automate server setup and built-in TCP/IP networking for simplified administration in heterogeneous environments.*
- *Deep integration with leading IDEs including Rational Developer products, IBM WebSphere[®] Studio, Microsoft Visual Studio[®] .NET and the open source Eclipse framework.*
- *File conversion from other version control and SCM products, including CVS, to speed migration activities.*
- *Seamless upgrade to Rational ClearCase enables organizations to grow and meet evolving business needs without retraining, retooling or migrating data.*

Rational ClearCase provides complete software asset management for midsize to large development teams. It extends the value of Rational ClearCase LT by adding:

- *Flexible workspace management using dynamic or snapshot views. Dynamic views, provide global, transparent access to virtually any version of any element—a feature ideal for an audited build environment or a complex project that requires instantaneous updates to evolving source files*
- *Advanced build management to automatically produce a detailed bill of materials, re-create any previous build at any time, and provide build avoidance capabilities so developers do not spend time building files that have already been built by another developer*
- *Support for multiple repository server deployments for large-scale enterprise teams*
- *Mainframe development support, including IBM OS/390[®] and IBM eServer zSeries[®] platforms running SUSE LINUX operating systems*
- *Seamless addition of Rational ClearCase MultiSite that enables parallel development across geographically distributed environments*

“It is not good if your project has 200 developers and it takes on the order of 36 hours to complete the compile process each time someone wants to rebuild the product. With Rational ClearCase, we were able to reduce that time to about 30 minutes.”

—Peace Software

Rational ClearCase MultiSite is an optional addition to Rational ClearCase that enables parallel development across geographically distributed environments, offering:

- *Distributed development support enabling distributed teams on multiple distributed servers to create complex applications in parallel through automatic replication*

- *Simplified administration of all replicas from the local site via a Web-based administration console*
- *Automatic backup and restore to maintain business continuity in case of disaster*
- *Data integrity by automatically resending information in the event of network failure and recovering repositories in the event of system failure*
- *Improved performance by transmitting only incremental changes that appear in Rational ClearCase project repositories*

Rational ClearQuest: Flexible defect and change tracking and workflow management

Rational ClearQuest captures and manages all types of change requests throughout the development life cycle, including defects, enhancements, issues and documentation changes. Out-of-the-box, predefined workflows enable development teams to get up and running quickly. Workflows, as well as the user interface, defect and change request fields, queries and charts can also be easily customized using simple point-and-click features.

To ensure that the entire development team is tied into the change management process, Rational ClearQuest offers:

- *Robust, flexible workflow support including e-mail notification options*
- *Activity-based defect and change tracking*
- *Easy customization using simple point-and-click features*
- *Comprehensive support for queries with extensive charting and reporting*
- *Tight integration with Rational ClearCase for smooth access to software asset management*
- *Web interface for easy access from standard Web browsers virtually anytime, anywhere*
- *Wide platform support including Linux, Microsoft Windows and UNIX systems*
- *Deep integration with leading IDEs, including Rational Developer products, WebSphere Studio, Microsoft Visual Studio .NET, and the open source Eclipse framework*
- *Scaling to support projects of virtually any size*

For distributed development environments, IBM Rational ClearQuest MultiSite extends the value of Rational ClearQuest by offering:

- *Distributed workflow support enabling geographically disparate teams on multiple distributed servers to manage and track activities through automatic replication of schema repositories*

- *Data integrity by automatically resending information in the event of network failure and recovering repositories in the event of a system failure*
- *Improved performance by transmitting only incremental changes that appear in Rational ClearQuest repositories*

Simplifying development through activity-based change management

Activity-based change management allows you to manage and track individual changes to software assets throughout the application life cycle as higher-level activities rather than as changes to individual files and directories. Managing activities instead of their related assets within the context of the overall development process provides greater clarity and insight. It streamlines and simplifies the development process, enabling development teams to work together more efficiently and effectively.

“The best thing about Rational ClearQuest is that it is totally customizable. As our organization changes, Rational ClearQuest can change with it.”

—ProCard Inc

Rational ClearCase and Rational ClearQuest enable activity-based change management through Unified Change Management (UCM), the set of features within these products that enables you to define and manage changes to software assets as activities. With UCM you can associate specific versions of files and directories with activities. Operations, such as delivering code to the integration stream, are then performed on the activity instead of on individual files. This level of abstraction reduces the 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 versions of files being integrated. The status of activities in Rational ClearQuest is automatically updated when developers work on them in Rational ClearCase, helping keep the project status up to date.

By enabling this activity-centric approach, project members (including project leaders, developers, testers and customer support) can communicate more effectively. Developers can get up and running quickly on new projects. Teams can effectively baseline requirements together with code, models, test assets and more. Project managers can easily manage and track the status of proposed changes and better understand the impact of proposed changes across the project.

Through UCM, Rational ClearCase and Rational ClearQuest also provide customizable, automated workflows that consistently enforce the development process. 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.

By managing change through high-level activities and by managing the change process through workflows, Rational ClearCase and Rational ClearQuest can enable you to:

- *Streamline code reviews and testing efforts*
- *Reduce build and integration problems*
- *Automate the development process*
- *Facilitate reporting*
- *Simplify project management*

Start with an effective IDE

To meet your business objectives, it is critical to enable diverse development teams across your enterprise to deliver high-quality applications quickly. Developers need a development environment that supports the entire development life cycle—from development to integration and testing to ongoing maintenance.

Eclipse: Flexible open source technology

Eclipse is an open, extensible industry-supported platform designed for building diverse applications such as Web sites, embedded Java™ programs and C++ programs. Fast becoming a popular framework for cross-platform development, Eclipse offers many benefits to developers, including:

- *Cross-platform support for Linux, Windows, Solaris, IBM AIX 5L® and HP-UX operating environments*
- *A familiar and intuitive graphical project workspace*
- *Smooth integration of tools and features through plug-ins*
- *Support for both graphical user interface (GUI)- and non-GUI-based application development*
- *Availability at no charge to developers under an open source license*

By providing a common interface, an optimized process that closely parallels how developers work and the ability to support collaborative development with a common user model, the Eclipse platform is designed to enable increased productivity while leveraging existing and newly acquired tools.

Rational Developer products: Extending the value of Eclipse

Rational Developer products provide a flexible, portal-like integration of multi-language, multi-platform and multi-device application development tools. They are designed to enable developers to rapidly build, test and deploy dynamic applications. Visual tools, templates and wizards help developers quickly and easily perform many development tasks—from building dynamic Web sites and Web applications to developing advanced enterprise applications that span disparate platforms.

Rational Developer products can provide a single development environment that can scale to support multiple types of development, including Web, business logic, integration and traditional development. As a result, all the developers on a team use the same environment—customized to meet their individual development needs—and can easily collaborate as they develop applications.

Rational Developer products include:

- *IBM Rational Web Developer for WebSphere Software, an easy-to-use, highly productive development environment with visual rapid application development (RAD) tools for building and maintaining dynamic Web, Web services and Java applications*
- *IBM Rational Application Developer for WebSphere Software, a comprehensive development environment with high-productivity tools for building and maintaining Web, Web services, Java, Java 2 Enterprise Edition (J2EE™) and portal applications*

“Having Rational ClearCase and Rational ClearQuest integrated with Eclipse enables our developers to work faster, simply because they are not switching between multiple interfaces. Additionally, they get better performance by not having as many tools open on their desktop.”

—BearingPoint, Inc.

Rational Developer products are built on Eclipse technology. They are designed to enable developers to maximize productivity by integrating best-of-breed plug-in tools from IBM, IBM Business Partners and the Eclipse community to customize their development environment to match their roles and needs. This integration enables developers to focus on delivering a solution that satisfies their requirements instead of switching between various development tools.

Integrated SCM is the key

If the goal is to develop higher quality applications faster and at lower cost, then the speed and ease with which development tasks can be performed is a major consideration. As discussed, effective SCM tools can improve productivity and reduce cost. However, performing change management operations from within their IDE allows developers to “stay in one place” and access SCM functions in the same familiar way they access other IDE functions, dramatically improving productivity.

World-class SCM integrated with Rational Developer products and Eclipse

Rational ClearCase and Rational ClearQuest are integrated with a variety of IDEs, including Rational Web Developer for WebSphere Software, Rational Application Developer for WebSphere Software and Eclipse. From within these Rational Developer products and Eclipse, developers can directly access Rational ClearCase and Rational ClearQuest functions. Rational Application Developer for WebSphere Software also makes it easier for teams to get started with SCM by including the Rational ClearCase LT software.

Rational ClearCase and Rational ClearQuest functions are exposed through product perspectives, views, menus, toolbars and context-sensitive pop-up menus. This allows Rational and Eclipse developers to interact with Rational ClearCase and Rational ClearQuest in the same way they interact with their IDEs. It also enables Rational and Eclipse developers to efficiently support collaborative development with a common user model. Additionally, the Rational ClearCase and Rational ClearQuest integrations provide several operations to help streamline and automate common tasks, further improving developer productivity.

Although Rational ClearCase and Rational ClearQuest functions are accessed the same way from both Rational Developer products and Eclipse, the remainder of this discussion is specific to Rational Application Developer for WebSphere Software.

Accessing IBM Rational ClearCase

To access IBM Rational ClearCase functions from within Rational Application Developer for WebSphere Software, the Rational ClearCase or Rational ClearCase LT client software must be installed. Once Rational ClearCase has been installed, Rational Application Developer must then connect to Rational ClearCase in order to enable Rational ClearCase operations within the IDE. You can do this by selecting the Connect to Rational ClearCase icon in the Rational Application Developer toolbar, as shown in Figure 1.

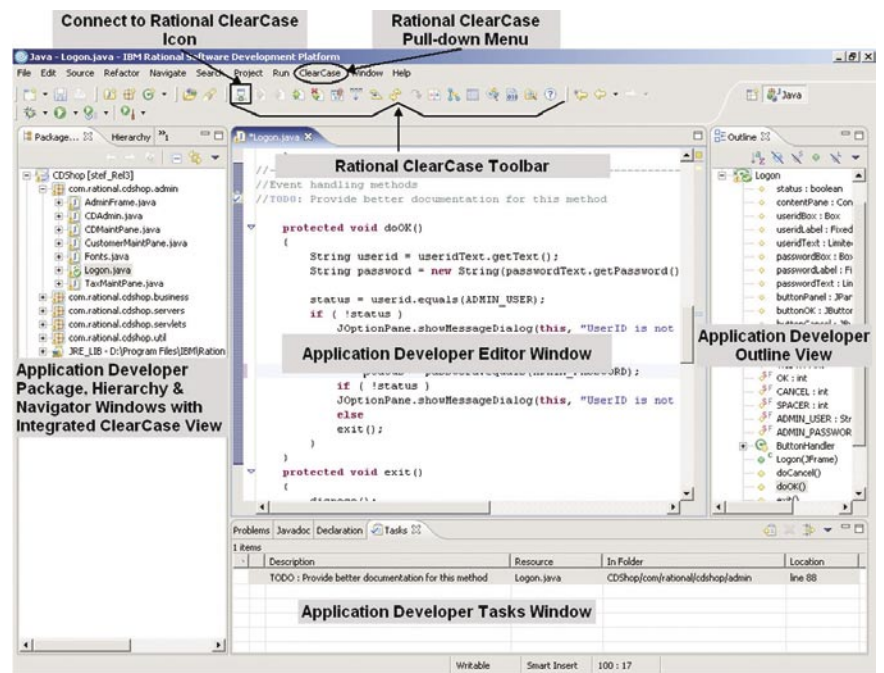


Figure 1: IBM Rational ClearCase access from IBM Rational Application Developer for WebSphere Software

After Rational Application Developer is connected to Rational ClearCase, Rational ClearCase functions can be accessed in several ways: through the Rational ClearCase pull-down menu; by selecting a file, right-clicking and selecting the Team option from the context menu; or by clicking on icons on the Rational ClearCase toolbar.

The Rational ClearCase pull-down menu, shown in Figure 1, enables Rational Application Developer for WebSphere Software users to perform specific Rational ClearCase operations from within the Rational Application Developer workspace. If using Rational ClearCase LT, items only supported in Rational ClearCase but not in Rational ClearCase LT will be disabled. Rational Application Developer for WebSphere Software users must upgrade to Rational ClearCase to access these functions.

The Rational ClearCase toolbar, also shown in Figure 1, is used to perform frequently used Rational ClearCase functions. Developers can quickly and easily perform Rational ClearCase and UCM functions through a simple mouse click from within the Rational Application Developer workspace.

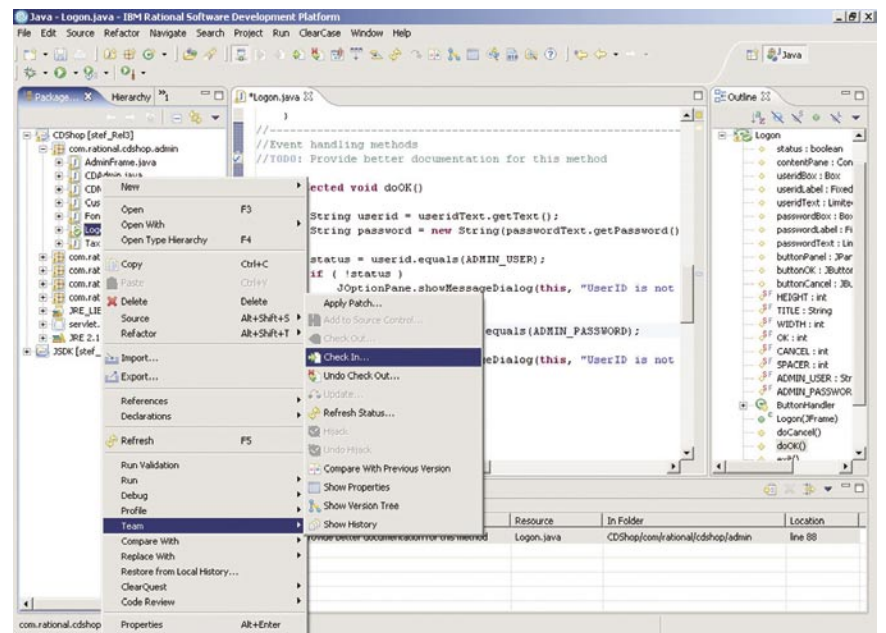


Figure 2: IBM Rational ClearCase access from the Team Context menu

The Rational ClearCase Team option on the context menu, shown in Figure 2, provides another method of accessing Rational ClearCase functions directly from Rational Application Developer for WebSphere Software. Note that many functions, such as source control operations, are available on common project files through the Rational ClearCase pull-down menu, Rational ClearCase toolbar and Team option on the context menu.

The following table provides an overview of Rational ClearCase functions that can be performed from within the Rational Application Developer for WebSphere Software user interface. Specific information on each function is available via IBM Rational ClearCase online help within the Rational Application Developer user interface.

IBM Rational ClearCase menu options	Team Context menu options	IBM Rational ClearCase toolbar icons
Connect to Rational ClearCase	Add to Source Control	Connect to Rational ClearCase
Set Current Activity	Check Out	Add to Source Control
Deliver Stream	Check In	Check Out
Rebase Stream	Undo Check Out	Check In
Update View	Update	Undo Check Out
ClearCase Build*	Refresh Status	Set Current Activity
Run ClearCase Explorer	Hijack	Deliver Stream
Find Checkouts	Undo Hijack	Rebase Stream
Find Resources to Add To Source Control	Compare With Previous Version	Refresh Status
Run Merge Manager	Show Properties	Update
Create New View	Show Version Tree	Compare With Previous Version
Join UCM Project	Show History	Show Version Tree
Edit View Properties		Show Properties
Start/Stop View*		Update View
Mount/Unmount VOB*		ClearCase Build*
ClearCase Help		Run ClearCase Explorer
		ClearCase Help

Table 1: IBM Rational ClearCase functions in IBM Rational Application Developer for WebSphere Software

Working Remotely with IBM Rational ClearCase

Changes in today’s work environment enable more and more software developers to work from home or other remote locations using broadband or dial-up connections. Rational ClearCase provides software asset management features that make it easy for development teams to work with resources in a shared repository regardless of where team members are located. The Rational ClearCase Remote Client feature allows developers to access Rational ClearCase from a variety of network connections, including broadband (WAN) and dial-up, in addition to traditional local area networks (LANs), using an HTTP(s) connection to a Rational ClearCase Web server.

* Feature is not available in IBM Rational ClearCase LT

The Rational ClearCase Remote Client is a lightweight, rich client interface that can be used as a stand-alone application or completely integrated with Rational Developer products or Eclipse. To access Rational ClearCase functionality from within Rational Application Developer for WebSphere Software, users must first install the IBM Rational ClearCase Remote Client into their current Rational Application Developer installation. Once the Rational ClearCase Remote Client has been installed, users can access Rational ClearCase capabilities from the ClearCase perspective. Rational ClearCase capabilities can also be easily added to any Rational Application Developer perspective by selecting *Window > Show View... > Other*, and then selecting *ClearCase* and the view you wish to add to the current perspective. The following views are available from the ClearCase perspective or from any other Rational Application Developer perspective:

- *ClearCase Navigator*
- *ClearCase Details*
- *ClearCase Search*
- *ClearCase View Configuration*
- *ClearCase History*
- *ClearCase Deliver*
- *ClearCase Rebase*
- *ClearCase Merge Search Results*

Once the Rational ClearCase Remote Client has been installed, Rational Application Developer must connect to a Rational ClearCase Web server to enable Rational ClearCase Remote Client operations in the IDE. You can do this by selecting the Connect to Rational ClearCase Server icon in the Rational ClearCase perspective. Then Rational Application Developer for WebSphere Software users can perform the following functions from the Rational ClearCase perspective:

- *Create and manage Rational ClearCase Web views. Rational ClearCase Web views allow users to access Rational ClearCase repositories via a HTTP(s) connection to the Rational ClearCase Web server*
- *Perform basic version control operations, such as check in, check out and add to source control*
- *Compare and merge files and perform advanced merge searches*

- *View/edit properties of Rational ClearCase objects*
- *View the history of Rational ClearCase elements*
- *Perform namespace operations on Rational ClearCase elements*
- *Perform UCM operations such as Deliver, Rebase and Finish Activity*
- *View Cheat Sheets to quickly get started with the Rational ClearCase Remote Client using a task-oriented approach*

Additionally, the Rational ClearCase Remote Client can be integrated with other perspectives through the Team context menu, Rational ClearCase menu bar and Rational ClearCase toolbars. The integration has been designed to enhance developer productivity by providing capabilities such as:

- *Ability to import Eclipse projects and Team Project Sets directly from the Rational ClearCase perspective*
- *Automatically update Rational ClearCase view load rules during the import of Eclipse projects or Team Project Sets*
- *Performs comparisons and merges of Java source files within the IDE*
- *Perform long-running operations in the background*
- *Quickly compare or replace workspace resources with other Rational ClearCase versions through the Compare With and Replace With context menus*

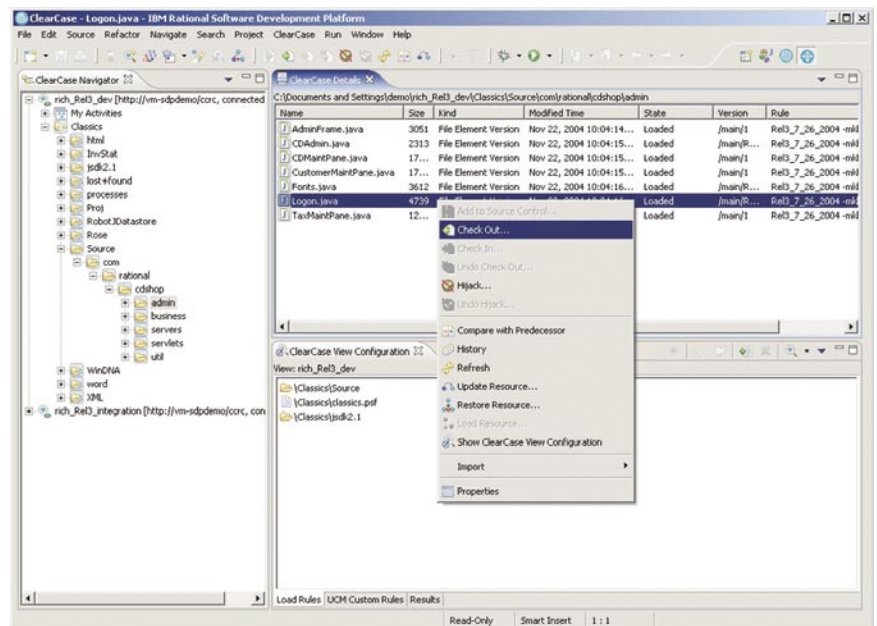


Figure 3: The ClearCase perspective in IBM Rational Application Developer for WebSphere Software

Accessing IBM Rational ClearQuest

To access Rational ClearQuest functionality from within Rational Application Developer or Eclipse, users must first install the IBM Rational ClearQuest Client for Eclipse into their current Rational Application Developer or Eclipse installation. Once the Rational ClearQuest Client for Eclipse has been installed, users can access Rational ClearQuest capabilities by opening the ClearQuest perspective. Rational ClearQuest capabilities also can be added easily to any Rational Application Developer perspective by selecting *Window > Show View... > Other*, and then selecting ClearQuest and the view you wish to add to the current perspective, as shown in Figure 4.

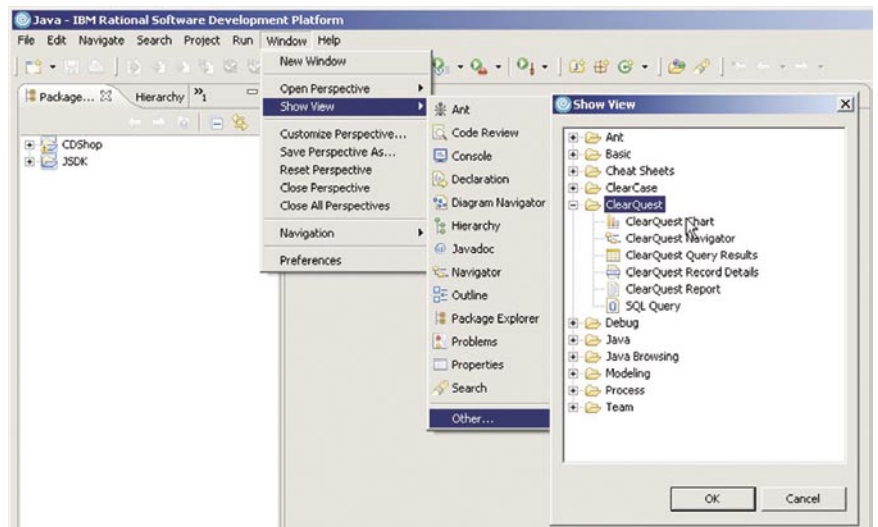


Figure 4: Adding an IBM Rational ClearQuest view to a perspective

The following views are accessible from the Rational ClearQuest perspective or from any other Rational Application Developer perspective:

- *ClearQuest Navigator*
- *ClearQuest Query Results*
- *ClearQuest Record Details*
- *ClearQuest Chart*
- *ClearQuest Report*
- *ClearQuest SQL Query*

The Rational ClearQuest integration also leverages the standard Eclipse views such as the Properties and Console views.

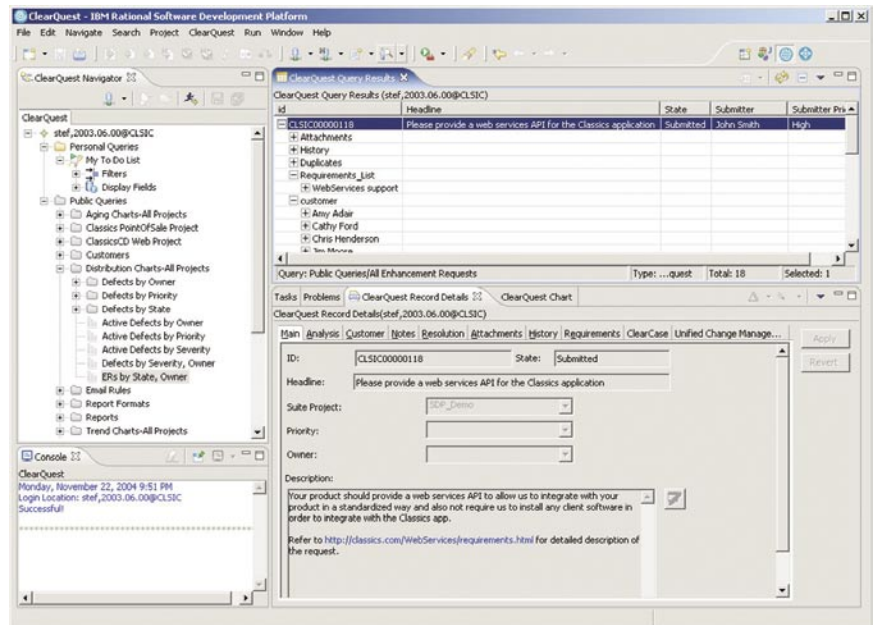


Figure 5: ClearQuest perspective in IBM Rational Application Developer for WebSphere Software

It's just that easy. As soon as the ClearQuest Client for Eclipse has been installed, Rational Application Developer users can perform the following Rational ClearQuest functions from the Rational ClearQuest perspective:

- Log on to any Rational ClearQuest user database or multiple databases simultaneously.
- Create, modify and run any public or private queries from the Rational ClearQuest Navigator view.
- View the query results directly in the Rational ClearQuest Query Results view.
- Select and run any public or private charts from the Rational ClearQuest Navigator view.
- View charts directly in the Rational ClearQuest Chart view.
- Select and run any public or private reports from the Rational ClearQuest Navigator view.
- Create new reports from existing report formats.
- View report results directly in the Rational ClearQuest Report view.
- View and update detailed information for any record in the Rational ClearQuest Record Details view.
- Submit any Rational ClearQuest record type directly from the Rational ClearQuest Query Results view, the Rational ClearQuest Menu or Rational ClearQuest toolbar.

- Print record details and query results from the Rational ClearQuest Record Details and Query Results views.
- Create templates for record submission forms.
- Open attachments directly within Eclipse-based editors based on file type.

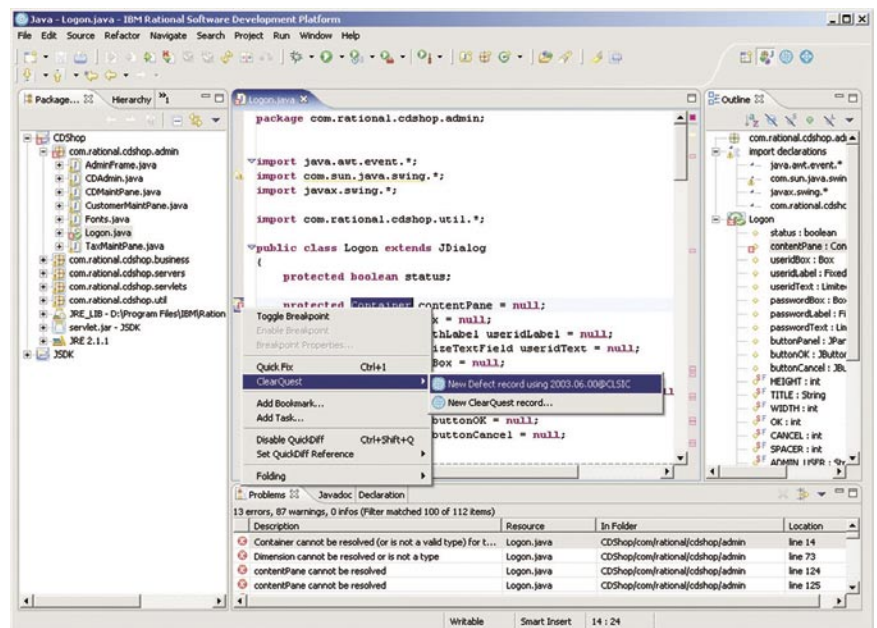


Figure 6: Submitting a new IBM Rational ClearQuest defect from a compiler error in the Java editor

Additionally, the Rational ClearQuest Client for Eclipse has been designed to enhance developer productivity by providing capabilities such as:

- Ability to submit and run queries and view query results from any perspective in Rational Application Developer or Eclipse
- Single-click submission of new Rational ClearQuest records for compiler errors or warnings in the Problems view or Java editor, as shown in Figure 6
- Ability to submit new Rational ClearQuest records for items in the Eclipse Tasks view or any general Eclipse resource, such as a Java class or package

The Rational ClearQuest Client for Eclipse provides users of Rational Application Developer with all the Rational ClearQuest tools they need tightly integrated in their IDE.

Best practices

Having a good tool is one thing; using it effectively is another. Seven areas of best practices are identified for using Rational ClearCase and Rational ClearQuest with Rational Developer products or Eclipse. These best practices have been gleaned from vast experience working with these products and can help you enable more efficient development.

Isolate subsystems or architectural layers into separate components

A component-based architecture helps promote software reuse and sharing among applications. In a Java or J2EE application, a good candidate for a component is any logical grouping of files that need to be baselined and released independently or that are shared by multiple applications. For example, a Rational Application Developer project that produces several Java archive (JAR) files that are shared among many applications may be a good candidate for a component. With UCM, these components can be baselined independently and shared among multiple UCM projects. UCM components should not be confused with fine-grained Java artifacts, such as classes, packages, JARs and enterprise archive files (EARs), which do not necessarily constitute UCM components by themselves. Creating UCM components for such fine-grained artifacts may lead to an unnecessarily large number of components.

Perform version control for necessary files only

Source files are generally versioned and shared with other project team members, while files that have been built in a developer's private stream are typically not intended to be shared with the entire team. Users must ensure that the right files are versioned; a user may not want to version and share compiled files (ex: .class files) and build settings, but may wish to version and share source files. Rational Developer products provide an option for ignoring specific file types that you do not wish to add to source control. The Rational ClearCase integration adds a default list of file types to this list of ignored resources. See the Rational Developer products help for more information on ignored resources.

Use a staging area for versioning deployed assets

Although files that have been built in a private development stream are not typically shared, it is a good practice to perform version control on built artifacts that will be deployed as part of an application once a stable baseline of that application has been produced. This is typically done in a staging area VOB whose structure often reflects the structure of the deployed application.

Use a separate Rational Developer workspace for each ClearCase view

Often, developers work with multiple Rational ClearCase views to access different versions of the same Rational Developer project, and these views must be accessible from the Rational Developer workspace. It is recommended that you associate one Rational ClearCase view with a unique Rational Developer workspace. For example, if you want to work in a parallel-development environment where you have a development view A for bug fixes to release A and another development view B for release B of the same application, you should use two different Rational Developer workspaces—one for view A and one for view B. This makes it easy to switch among different versions of the same Rational Developer project by simply opening another workspace associated with the necessary Rational ClearCase view. It is also a good practice to use the same name for the workspace as the Rational ClearCase view it is associated with. To switch from one workspace to another, select File > Switch Workspace from the main Rational Developer menu and select the desired workspace.

Create a standardized development environment

It is important that all project team members share a common development environment to help ensure consistency and reduce integration problems typically related to inconsistent build settings or other configuration problems. One way to help avoid these problems is by sharing common configuration information with simple projects. Simple projects can be used to store common

project artifacts, such as getting-started instructions, build instructions and guidelines for team preference settings. Sharing this information can save developers time by providing consistent workspaces, build settings and other environment settings.

Use Team Project Sets to define consistent lineups of Rational Developer projects

Team Project Sets specify a list of Rational Developer product projects that are under version control, which can then be quickly imported all at once. Using Team Project Sets saves time for developers because they do not have to import individual projects. They are also free from having to understand project dependencies and they can ensure consistency within each workspace.

Add third-party libraries to source control

To help eliminate dependencies on local build environments and incompatibilities between JAR versions, third-party JAR libraries should be placed under version control. Rational Developer product projects can then reference these third-party libraries as external JARs, allowing team members to have a common class path because the JAR files are stored in a single, common location under version control.

Summary

Software developers face significant challenges, including increasing software complexity, increasing development environment complexity, mounting time-to-market pressure and higher software quality expectations. Software configuration management can help reduce or eliminate these challenges.

IBM Rational ClearCase and IBM Rational ClearQuest are proven SCM solutions that manage change and complexity. Going well beyond version control, they provide advanced capabilities that enable parallel development, promote reuse, support large distributed teams, reduce build/release cycle times, minimize downtime and reduce risk.

Rational ClearCase and Rational ClearQuest are seamlessly integrated with IBM Rational Developer products and the open source Eclipse framework. This deep integration enables a wide array of SCM operations to be performed directly from within the Rational IDEs and Eclipse framework. By combining these popular Java and J2EE IDEs with industry-leading SCM solutions, IBM delivers everything that developers need to work effectively in a team environment without requiring them to leave their IDE. The result can be dramatically increased productivity, improved quality and maximum business value.

For more information

Rational ClearCase and Rational ClearQuest plug-ins for Rational Application Developer for WebSphere Software, Rational Web Developer for WebSphere Software and Eclipse are available for download at:

ibm.com/developerworks/rational/

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