Rational software

How the IBM Rational Team Unifying Platform integrates with IBM Development Tools

by Reid Gerson, Market Manager
IBM Rational Software

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Introduction

This whitepaper introduces the IBM Rational Team Unifying Platform (TUP), which is part of the IBM Rational Software Development Platform (SDP). The paper will discuss the various products that make up TUP and how the platform will help customers develop better applications faster. A great synergy exists between TUP and IBM development tools, such as IBM Rational Application Developer, IBM Rational Web Developer, and IBM WebSphere Studio Application Developer Integration Edition. While developers build, test, and deploy Web, Web services, and Java applications, their entire teams need to ensure that they put code in line with project requirements; maintain code versions; are timely informed when requests for change occur; are aware of the overall project status; and build test cases that validate the code against project requirements. The TUP unifies software development teams by guiding them on how to write good software and on automating these best practices with tools.

The IBM Rational Team Unifying Platform

The IBM Rational Team Unifying Platform is a collection of integrated software development tools, a process, and a project measurement tool that can together increase the effectiveness of software teams and is used by many software practitioners, including project managers, analysts, architects, developers, and testers. Members of a software team needs to follow a common software development process, know project status, understand requirements, and manage his or her own specific assets (whether requirements for analysts, designs for architects, code for developers, and test artifacts for testers). TUP can be extremely valuable to all development organizations because it unifies the software team by providing members the necessary infrastructure to collaborate successfully.

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What is the IBM Rational Team Unifying Platform?

An integrated suite of software development tools:

- Requirements management   IBM Rational RequisitePro
- Defect and change tracking   IBM Rational ClearQuest
- Software configuration management   IBM Rational ClearCase LT
- Test planning   IBM Rational TestManager
- Project documentation automation   IBM Rational SoDA

A process:

- Software development best practices   IBM Rational Unified Process

And a project measurement tool:

- Project measurement   IBM Rational ProjectConsole

In the overall software development lifecycle, the IBM Rational Team Unifying
Platform facilitates the transition from IBM WebSphere Business Modeler
business models to successfully delivered software. IBM Rational Software
Architect and IBM Rational Software Modeler are software modeling tools that
use business models to design software architecture. IBM Rational Software
Architect or IBM Rational Application Developer then can create the code.
The TUP tools manage the requirements that lead to the software design and to
the test artifacts that validate the code that the developers generate with these
tools, so that developers comply with the original requirements. When there are
changes to requirements, whether they are defects or enhancement requests,
the architect or analyst can effectively assess and manage them before they
reach busy developers. The software team can follow consistent processes that
flow from one to the other rather than conflicting with one another.

*The IBM Rational Software
Development Platform provides the
solution to software development
chaos thru the Team Unifying Platform.*

*Ideally, teams edit requirements in one
place so everyone can view them in
one central location.*

Poor team collaboration leads to chaos

Most software teams live in a chaotic environment created by poor
communication between team members. Too often, a one-way communication
between analysts and developers and between developers and testers creates
walls rather than collaboration. This situation can lead to excessive rework,
poor assumptions (due to incomplete specifications), and missed deadlines.
The lack of trustworthy project information can lead to decisions made in
a vacuum instead of based on facts. The project manager can have more
questions than answers about the state of the project. Overall, a lack of
collaboration in cross-functional teams (analysts, testers, developers) can lead
to that chaos. Tools can help facilitate collaboration by sharing project artifacts
more widely and accurately.

Winning development teams collaborate throughout the life of an application—
from the discovery phase, where they learn and capture goals and requirements
and identify existing reusable assets; to the development phase, where
they implement these requirements; to the deployment phase, where they
perform final testing, maintenance, and monitoring. Through this cycle,
from requirement to retirement, all team members share responsibilities for
maintaining best practices as well as for the specific expertise they contribute
to the team. The IBM Rational SDP provides this solution to software
development chaos through the TUP.

Eliminating chaos: Quick access to project data

To eliminate chaos, quick access to project data is needed, including
requirements, defects, change requests, and test plans, so that each team
member can quickly access what is needed to accomplish the work. Testers,
for instance, need to have access to requirements to make sure they test the
right thing. As requirements change, testers need to be aware of the changes;
otherwise, they will continue working on obsolete test cases. Ideally, teams
edit requirements in one place so everyone can view them in one central
location, instead of duplicating requirements in multiple tools (the developer
tools, the tester tools, and so on). Too often teams email project information,
which can result in using the wrong specification instead of the latest version.

A project portal represents a Web site that provides centralized access into multiple information areas. From that Web site, you can view requirements, defects, and so forth. When team members complete their work, the site automatically updates defect status, so the team does not rely on developers to remember to do so. Project documentation automation improves quality and reduces documentation cost.

*Create requirements in Rational
RequisitePro, but accesses them
from Rational TestManager
and Rational ClearQuest.*

Access to up-to-date data without artifact duplication
How does the Rational Team Unifying Platform provide access to up-to-date data? Your team creates requirements in RequisitePro, but access them from Rational TestManager and Rational ClearQuest. A tight integration between TestManager and RequisitePro provides testers access to the latest state of requirements. In addition, the tight integration ensures that as requirements change, testers are automatically notified that a change may impact a test case, thus ensuring that testers stay in sync with the latest application. A tight integration between TestManager and ClearQuest ensures that testers can provide developers the exact environment to reproduce a defect. The key to this solution is that you don't need to duplicate artifacts, and no synchronization wizard needs to run to ensure that testers view the latest state of requirements. Rather, the testing tool has dynamic access to the requirements information.

Viewing TUP tools in Eclipse-based Rational Practitioner tools

The Team Unifying Platform tools have started to migrate into the Eclipse framework. Developers can view requirements from their environment. Using Eclipse-based IBM Rational Software Architect or IBM Rational Software Modeler, developers can have up-to-date access to the latest state of requirements stored in IBM Rational RequisitePro.
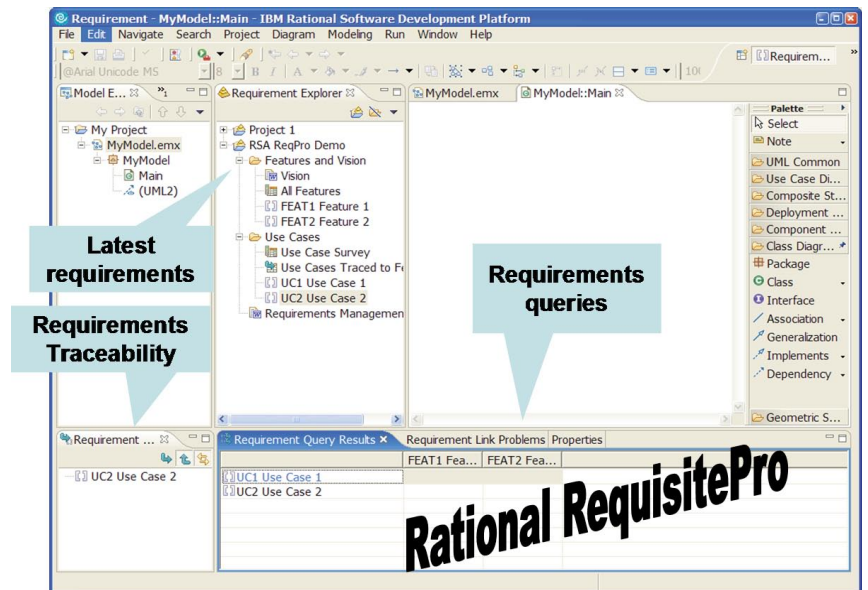

Figure 1. Viewing requirements in Rational Software Architect and Rational Software Modeler.

Similarly, developers can access defects, change requests, and their personal to-do list with the Rational ClearQuest Eclipse plug-in. Rational ClearCase and Rational ClearQuest can plug into either the Eclipse 3.0 SDK or Rational Web Developer, Rational Application Developer, Rational Software Modeler, or Rational Software Architect.
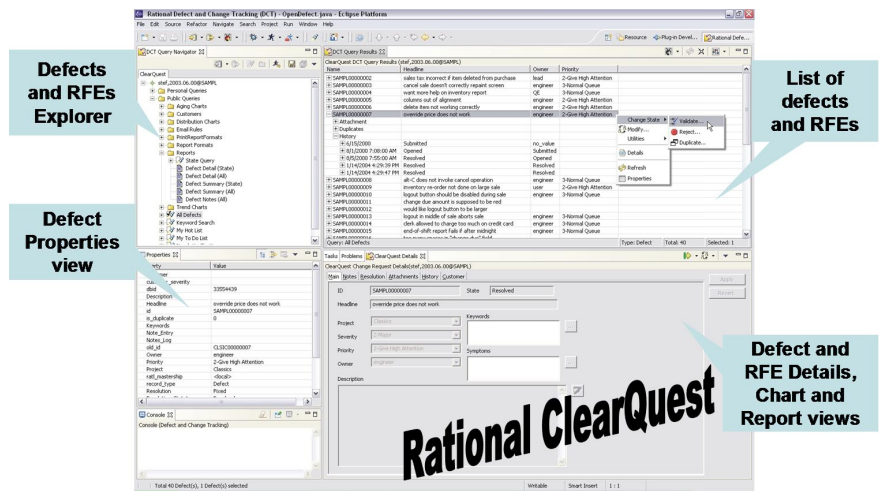
Figure 2. Viewing change requests in Eclipse-based tools.

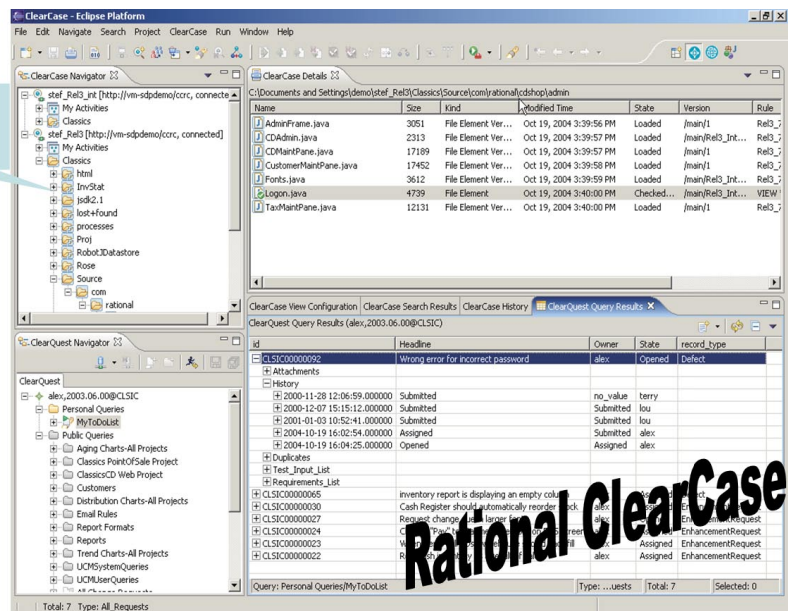Using the ClearCase Eclipse plug-in, developers can view the various versions of their code.

Figure 3. Viewing version controlled source code files in Eclipse.

Process guidance for software architects and developers.

The Rational Unified Process (RUP), part of TUP, acts as a process advisor in Rational Software Architect and Rational Application Developer. It brings contextual process guidance to developers' fingertips. You can view RUP content in three ways: the Process Advisor, Process Browser, and Search. You do not have to start a separate RUP browser.
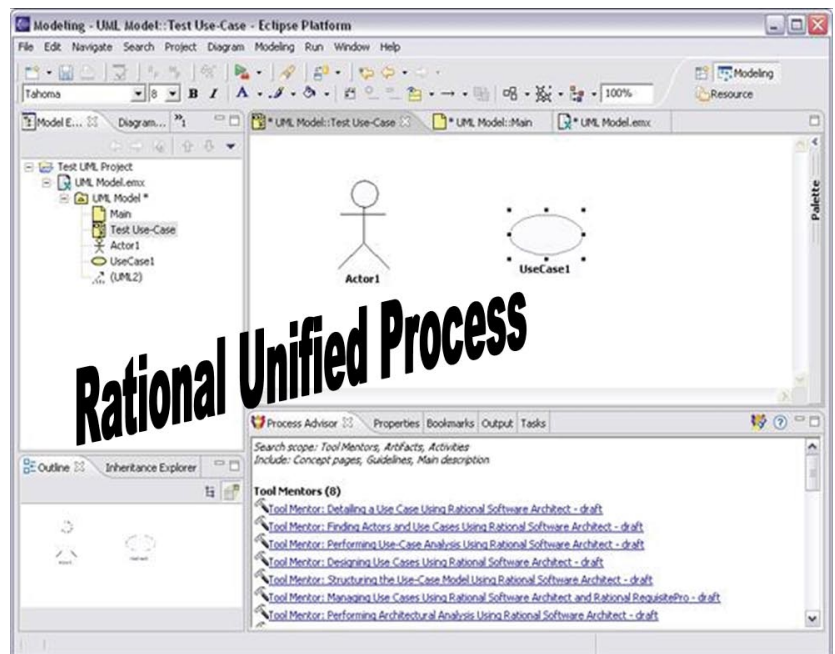

Figure 4. Integrated context-sensitive process guidance in Rational Software Architect and Rational Application Developer.

*The project measurement tool in
Rational Team Unifying Platform
extracts individual project status
into a project portal and makes project
status readily available to all.*

Accurate accessible project status with Rational Project Console

Another key to eliminating chaos is to make certain project status is accurate and accessible, so that you can make decisions based on actual project status, rather than guesstimates about at what stage the project is. Project managers should be able to view the project status by rolling up each individual's status. Testers' statuses should provide where they are in their efforts to validate requirements; developers' statuses should show how much they have implemented; and so on. Everyone on the team should be aware of who is in the red (who needs help), what the analysts are working on, and so forth. And because everyone sees information in a different way, you should be able to customize how you present the project status information. To provide accurate project status, the project measurement tool in Rational Team Unifying Platform, Rational ProjectConsole, extracts individual project status into a project portal and makes project status readily available to all – so that you can avoid wasting time looking for information and base business decisions on facts.
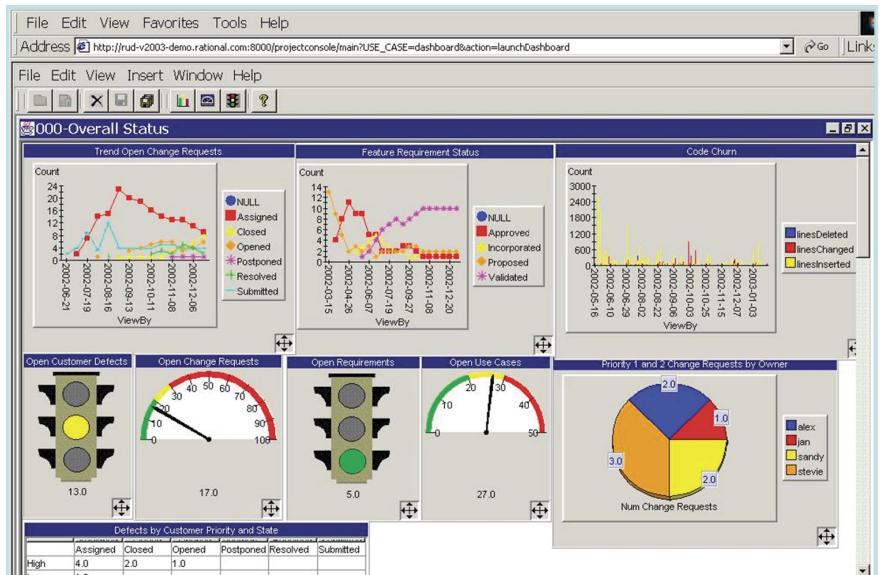

Figure 5. Rational Project Console.

*Complete software asset management
for midsize to large development
teams.*

Enterprise change management
In software organizations, change is pervasive and too often uncontrolled,
which leads to feature creep (more and more features to implement), and
consequently, missed deadlines and poor quality. An effective change
management process should:

• Collect all changes systematically and in a central place

• Put in place a reliable and predictable change management process

• Control feature creep by mandating activity tracking

• Understand the true impact of changes before accepting change

• Communicate accepted changes on time to the right people

To control change, the IBM Rational Team Unifying Platform provides an
activity-based change process where you link activities that plan and track
progress with the actual artifacts under version control in IBM Rational
ClearCase. This process, called Unified Change Management, prevents
changes to artifacts not linked to approved activities. IBM Rational ClearCase
has been reported the Software Configuration Management #1 leader
for the past four years (International Data Corp, SCM Tools Forecast
and Analysis, 2001-2005).

*The IBM Rational Team Unifying
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elements, or test cases.*

Visibility into dependencies

Chaos is also the result of individuals working in silos with no visibility into
what others are doing and how it affects their work. Linking artifacts helps
connect the dots. With that connection, you can make sure everyone is on the
same page. You can:

• Link enhancement requests to requirements. This provides a way so that
selected stakeholder requests make their way to implemented requirements.
It also provides a rational (source) for requirements.

• Link requirements to test cases. Test cases only exist to validate what is to
be delivered to customers, and requirements represent that expectation.
By linking requirements and test cases, you can make validation happen at
the right place. Requirements will change and testers must know which test
cases are affected in order to update them on time.

• Link requirements to requirements. Higher-level requirements, like
business requirements, may change along the way, and you should propagate
that change to more detailed requirements to meet that business objective.

• Link defects to test. Defects generated from test-log results auto-populate
the key defect info into Rational ClearQuest. That way the developer has easy
access to critical info in order to reproduce and diagnose the problem.

To help assess whether or not a change is accepted, the IBM Rational Team
Unifying Platform provides a visual way to see the impact of a requirement
change to either other requirements or design elements (in IBM Rational
RequisitePro), or test cases (in IBM Rational TestManager).

Collaborative software process

Finally, you can avoid chaos by making sure software processes work in harmony. What developers do should be in sync with what testers need. Unless you have software guidelines that consider all roles, how can you make sure that work is limited to what is necessary?

To provide consistent software process guidelines, IBM Rational Team Unifying Platform includes the well-known Rational Unified Process (RUP), a Web browser that codifies lessons learned in software development. It organizes the information by role in a software team and covers the entire lifecycle so that deliverables from one role are beneficial to other roles. It also provides project information in formats familiar to each role.

Summary

The Rational Team Unifying Platform is extremely valuable to any software development organization, because it can unify the team through a common set of artifacts, tools, and processes and provide members with the necessary infrastructure to collaborate successfully — all within their IDE. In combination with IBM development tools, the Team Unifying Platform can run as a unified software development platform with a common look, feel, and integrate with your IDE.

The IBM Rational Team Unifying Platform equips software teams with:

- Access to the latest requirements, defects, test plans, and results

- Visibility into software project data dependencies

- Accurate project status and reports

- Effective change management

- Collaborative software development process