

Rational Rose RealTime

The Real-Time Embedded Challenge

Software development teams all face the same software development paradox — how to develop applications faster without compromising quality. Developers of real-time embedded software face additional challenges. Such software is highly event driven, concurrent, and often distributed. Stringent requirements must be met for latency, throughput, and dependability. The capture and effective communication of designs for such systems is a daunting task.

Rational Rose RealTime

Rational® Rose® RealTime is a complete lifecycle Unified Modeling Language™ (UML) development environment expressly created to meet these real-time embedded challenges. It provides a UML-compliant solution to the unique problems of concurrency and distribution. Rational Rose RealTime unifies the project team by providing an extensive set of tool integrations to meet the needs of the entire team, from requirements capture through to high-performance code generation, testing, and debugging for real-time operating system targets. In combination with the Rational Unified Process®, your project has a proven pragmatic approach to reducing development risk.

- A UML model compiler generates complete C, C++, and Java applications for UNIX, Windows NT/2000, and real-time operating system targets. This automated code generation eliminates the need for manual translation and avoids costly design interpretation errors.
- An associated visual UML model debugger enables observation and validation of host and target applications. Model execution encourages early design refinement.
- A complete UML-based testing facility lets the user graphically define system behavior, then automatically generate and execute test cases and test suites for complete or partial models. It supports continuous verification of quality right from the beginning of system implementation.

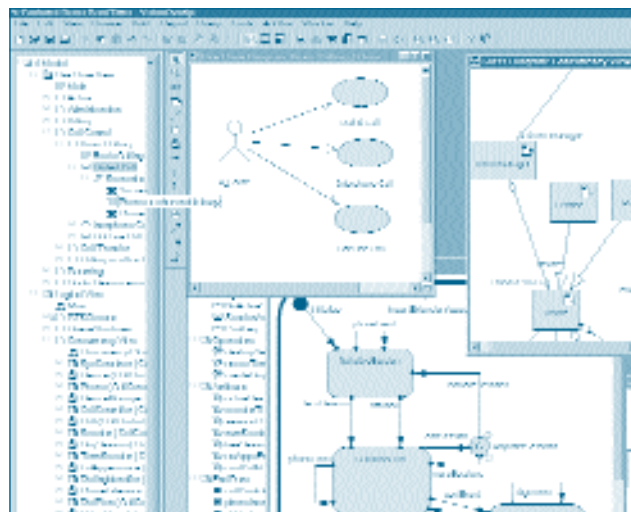
The Real-Time Embedded Development Choice

Rational Rose RealTime is based on market-leading technology that extends Rational Rose, the world's leading visual modeling tool, with field-proven UML model code generation and visualization.

"Rational Rose RealTime's strengths are in modeling, code generation, and the visualization of models during execution. IDC's opinion is that these key features coupled with the full complement of industry-standard UML support makes Rational Rose RealTime a major contender as the de facto standard for real-time embedded system development."

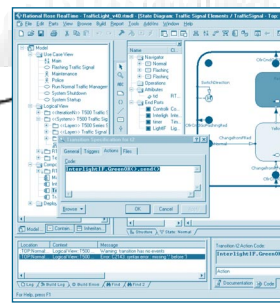
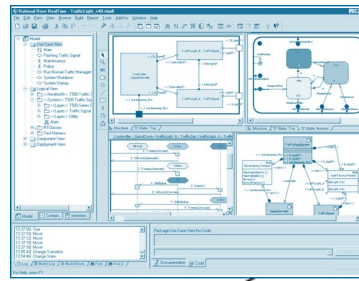
Steve Garone, Research Director for International Data Corporation (IDC)

UML supports the entire software development lifecycle

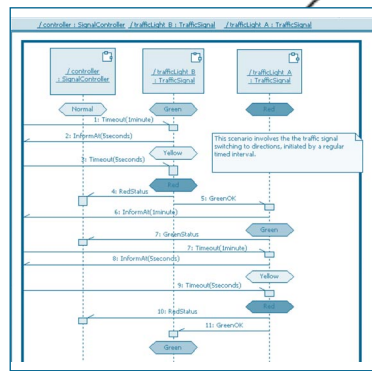


Accelerating Embedded Software Development

Advanced model compiler generates complete real-time C++ and Java executables directly from your design models

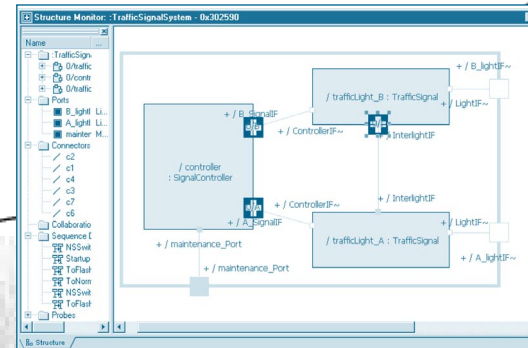


Use sequence diagrams to specify design behavior



Analyze, Design, Compile, Execute, Debug and Test

Automatically verify behavior against the suite of specification sequence diagrams at every step of the implementation process.

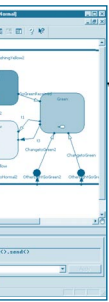


Model debuggers let you trace messages exchanged between model elements to get a high-level view of model runtime behavior

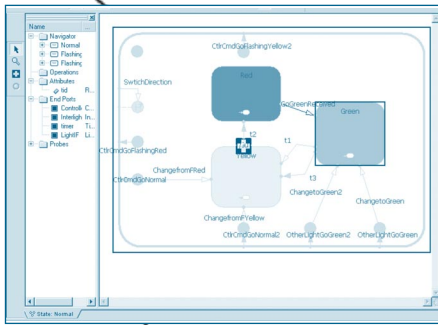
Iterative Development

Rational Rose RealTime supports an iterative development strategy that reduces your development risks. Reverse engineering enables you to understand your existing systems. Code generation technology lets you compile and execute your designs at the earliest stages of product inception. Early execution on the host or target platform provides you with the feedback you need to discover and correct design flaws earlier, lower costs, and minimize risk.

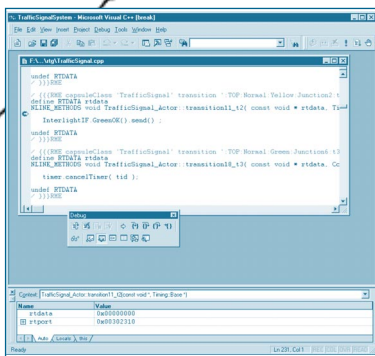
Rational® QualityArchitect RealTime is an extension to the visual modeling capability of Rational Rose RealTime. It enables Rational Suite® DevelopmentStudio RealTime Edition and Rational Rose RealTime Professional Edition users to perform model-based component testing by generating code automatically from within the Rose RealTime model. For the first time you can automatically build stubs and drivers to use in testing components and classes. And, these generated tests can be executed automatically. Rational QualityArchitect RealTime supports a wide range of testing activities from developer scenario-based debugging to full system regression testing.



State machine model debugger with state change animation and model-level breakpoints lets you diagnose UML designs directly



Integrated symbolic debugging on host and target



Observe model execution, with integrated symbolic debugging, on host and target

circuits, they adapt well to various reuse and distribution situations. Active objects can be flexibly mapped to operating system threads and processes.

In Rational Rose RealTime, active objects are modeled as UML-compliant capsules. Capsules can be hierarchically decomposed into collaborating sub-capsules, and thus can be used throughout the development cycle — from executable architectures to lowest-level design elements. Capsules enable your team to design real-time embedded systems the way they really operate.

Productivity Depends on Clear Communication

Real-time embedded systems often require large-scale development teams to handle the complexities of design and construction. Without good communication and the clear capture of system architecture, developing in such an environment can be disastrous. Rational Rose RealTime can help you avoid such pitfalls.

- Improve communication between all members of your team through the power of the UML.
- Integration between Rational Rose RealTime and Rational® Requisite Pro® ensures that no requirements get lost in translation from requirements to design.
- Capture your architecture more effectively and make it part of the implementation.
- Publish your designs to the Web using Rational Rose RealTime's Web Publisher. You can automatically generate documents via the integration between Rational Rose RealTime and Rational® SoDA®.
- Software Configuration Management and Version Control tool integration allows you to use products like Rational® ClearCase® to more effectively manage your UML application development.

Optimized Design Concepts

With Rational Rose RealTime, you model architectures and designs in a natural way that mirrors how real-time embedded systems actually work. For example, concurrency is inherent in such systems, and the resultant interaction among concurrent threads of execution raises many design challenges. A best practice solution to handling concurrency is the active object design pattern. Active objects encapsulate their own thread of execution thus preventing thread interaction problems. Since they communicate through message-based interface ports, like the pins on hardware integrated

A Complete Embedded Solution

The Rational Embedded Solution includes Rational Rose RealTime, Rational® Test RealTime and the Rational Team Unifying Platform. Test RealTime supports thorough verification of mission-critical and safety-critical systems at the unit, object and system level. It provides full trace, coverage, memory analysis, and performance observation both on the development host system and the target system to ensure complete testing in the most demanding applications.

An Open Platform Eases Integration and Adoption

Rational Rose RealTime is designed for simplified and streamlined insertion into your software development environment, processes, and workflows. Seamless integration with other Rational® Software products and support for a diverse set of commercial real-time operating systems offers development teams a complete solution that no other vendor can match.

Support for leading compilers and symbolic debuggers keeps you in control of your design. These integrations let you focus on the design of your software, rather than on the development environment or on tool interoperability issues.

Rational's Alliance Complete Your Development Solution

When Rational solutions are combined with the complementary products and services of over 500 alliances, customers are afforded the most comprehensive development environment available today. Rational's alliances with IBM, Microsoft, Sun Microsystems, Hewlett Packard, Intel, Borland, BEA, Vignette, WindRiver, TimeSys, GreenHills, and Tri-Pacific ensure broad product compatibility and a smooth transition to rapidly changing technologies.

Through the Rational Unified Partner Program, Rational and our partners are dedicated to making you more productive, optimizing your investment, and giving you the freedom of choice you expect and deserve. Whether it is for business process modeling, document generation, or architecture frameworks, our extensive network of technology and service providers are there to help.

Accelerate Success with Rational Services

Like all Rational tools, Rational Rose RealTime is supported by an extensive, worldwide service organization. Explore more than a thousand articles, white papers, courses and artifacts online at the Rational Developer NetworkSM. Build your team's capability through expert consulting and technical support services. And take advantage of more than 60 courses available from Rational University to speed technology deployment and accelerate your project's delivery. Available where and when needed, Rational Services improve self-sufficiency as they build a foundation for continuous software development improvement.

Unify the Team with Rational Suite

Rational Rose RealTime is a member of the Rational Suite® product family, available in Rational Suite DevelopmentStudio RealTime Edition. The Rational Suite family provides a comprehensive software development platform that will unify your team, optimize individual productivity, and simplify adoption of the Rational solution.

The Choice for Embedded Development

Rational Rose RealTime allows you to unify your team and work smarter. Rational Rose RealTime accelerates processes, ensures architectural quality, and streamlines manual tasks. It also positions you for today and tomorrow. Find out how Rational Rose RealTime can help you build better software faster. Visit www.rational.com/products/rosert to download evaluation software and demos, order the Rational Embedded Developer Solutions CD, and more.

SPECIFICATIONS

Support for leading RTOS targets including:

- Tornado/VxWorks
- Linux
- OSE
- pSOSystem
- VRTX
- LynxOS
- AIX
- QNX
- UnixWare
- ITRON3
- Chorus Classix
- Nucleus
- WinCE
- Support for other targets available

Product Integrations:

- Rational ClearCase®
- Rational ClearCase LT
- Rational RequisitePro®
- Rational SoDA®
- Rational ClearQuest™
- Rational Purify®
- Rational Quantify®
- Rational PureCoverage®
- Rational Test RealTime
- Rational Purify LT
- Rational Quantify LT
- Tri-Pacific RapidRMA
- TimeSys TimeWiz

Supported Platforms:

- Windows NT
- Windows 2000
- Windows XP
- Solaris 2.6, 2.7, 2.8
- HP-UX 10.20

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