Rational Java Tools: Bringing Twenty Years of Development Experience to a New Platform

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Reporter

Through its own internal efforts, and by working with partners throughout the industry, Rational is delivering a new set of tools to help ensure speed and quality development in the Java community -- much as it already has for the C, C++, and Visual Basic environments.

In the six years that Java has been available, the platform has attracted some 2.5 million developers worldwide, according to Sun Microsystems, Java's creator. Rational is working to make sure that those developers have access to a full lifecycle software development platform that includes modeling, change management, and other tools crucial for the corporate world.

"Rational's mission for the past twenty years has been to ensure the success of companies that depend on developing and deploying software," said Bill Taylor, Director of Product Marketing for Visual Modeling and Developer Tools at Rational. "If our customers choose Java as their execution platform, Rational will provide an enterprise lifecycle solution for them."

"We really are focusing much more on the individual developer than in the past," said Jack Greenfield, Chief Architect of the Practitioner Desktop Group at Rational Software. "Developers spend 80 percent of their day in the edit-compile-debug loop, and much of that happens in the integrated development environment. So we're recognizing that what developers need is a tight integration between their IDE, and the other tools they might use to do their job."
What this strategy parsing down to, Greenfield added, is providing "much tighter integration with the IDE than what people have seen from us before. In the past, we've had a number of point products assembled by the acquisition of a number of companies. The Rational Suite has been the mechanism to build tighter integration. We're now doing that around the Rose core."

Another long-term goal for Rational is to help raise the level of abstraction for developers, to isolate them as much as possible from having to know low-level details about how the underlying hardware and software works. Rational is already doing this, to a great extent, within Rose and its other tools by providing automation and other ways to let developers concentrate on the business logic instead of the details. (See Figure 1.)

The company is moving to help Java developers -- indeed, developers using any of its tools -- to create software by using high-level business terms and definitions whenever possible.

**Rational Suite Java Enhancements: Toward a Seamless Experience**

Nowhere are these goals more apparent than in the Java space. Over the past several weeks, Rational has announced additional support within existing products -- including its Rational Rose modeling tool and Rational Suite -- integrations between its tools and leading integrated development
environments (IDEs), and agreements to develop new tools specifically geared to Java:

- In v2001A of Rational Suite, enhanced Java development features support industry-leading IDEs from IBM, Sun, BEA, and Borland.
- Rational Rose RealTime now supports the Java 2 Micro Edition (J2ME) platform and the Mobile Information Device Profile.
- jRoundup.com, Rational's new online Java technology community, is already up and running.
- Rational and Sun are developing the industry's first end-to-end lifecycle development solution for Java and Solaris as well as a standard to define mapping between Enterprise JavaBeans (EJBs) and the Unified Modeling Language (UML).

Rational's new Java IDE support includes integrations between Rational tools and IBM's VisualAge for Java, Borland JBuilder, Sun Forte for Java, and WebGain Visual Café. Developers can now have their favorite editor, debugger, and lifecycle tools all in the same place, thanks to the new integrations. They can also work in their IDE of choice and reverse-engineer code changes directly from that IDE into the Rose model, so the model and the code always stay in sync.

In addition, this means that Java teams can now communicate visually, sharing information through one language -- the UML -- and one tool, Rational Rose. Developers can also design their database for high-performing Java applications.

And this level of integration will only get better, Rational's Taylor said. "Our direction is to continue to work closely with leading IDE vendors in the market, to provide a seamless experience for the customer." For an example of how Rational's tools are integrated with partners' IDEs, see Figure 2.

![Figure 2: Main Window of Sun Forte for Java, with Rational ClearCase Toolbar.](enlarged-view-url)

Specific Java-related enhancements to Rational Suite v2001A also include ease-of-use features that speed development. With the new Java design-pattern support, for example, developers can now use wizards to more easily create software that uses Java 2 Enterprise Edition (J2EE) technologies like Enterprise JavaBeans (EJBs), Servlets, and Java Server Pages (JSPs).

These new capabilities allow developers to step through the design and coding process much more quickly, with menu-driven access to selected
patterns that can be added to any visual model. They can stay focused on high-level design and coding, leaving low-level details for the tool to handle. Enterprise JavaBeans (EJB) and Servlet graphical user interfaces, too, are much easier to use, with easy navigation and selection of EJB versions 2.0 or 1.1, among other features.

In addition to these powerful new Java features, the Rational Suite offerings include enhancements to Rational Suite ContentStudio that expand the operating environment for Web developers: Now, customers can script JSP templates as well as ASP templates. They can also choose from a larger variety of J2EE application server platforms and can operate on the Solaris platform as well as on Windows NT.

"Our strategy is to give a Web development team that is using Java for their Web site everything they need to go from development to deployment -- and they can do that now," said Rachael Rusting, Group Product Marketing Manager for Rational Suite ContentStudio. "It supports building any Java application that someone would want." Prior to this release, ContentStudio, did not offer Java support.

**J2ME Real-Time Development: Doing It with Rose**

Rational's recent announcements on the real-time front reflect the fact that, with the recent addition of Rational Test RealTime, the real-time, embedded, and distributed market has become a strong and growing focus for Rational's new product development and integration efforts.

The goal here is two-fold: to continue to improve the tools given to developers in the embedded systems community, and to spread the technology within Rational's embedded solution into other market segments.

So say Marc Brown, Marketing Evangelist for Wireless and Embedded Solutions at Rational, and Andrew Lyons, Senior Product Manager for Wireless and Embedded Solutions at Rational.

Rational Rose RealTime can automatically generate up to 80 percent of an application's code and create the necessary test harnesses and stubs required for validation, directly from UML models. Part of this is due to the technology within Rose RealTime and Test RealTime, and part is because of the tight integration between Rose RealTime and the UML.

The idea is to spread that capability to as many markets as is feasible, Lyons said. "There are many applications that could benefit from this technology," he explained, "where we can add a lot of value to the development process by elimination of the many design errors that are so prevalent in today's software development efforts."

To take Rose RealTime into different markets, "the integrations you need are different," Brown said. "It's like drilling for oil instead of drilling a tooth at the dentist. All are drills, but they're different. We're going to take common pieces of the solution and integrate it with various market-specific attributes to provide the technology to the mass market."
The idea is that the same tools and technologies that help developers write real-time systems may also be applicable, say, to building business applications and user interfaces that have internal state and that must react to events under changing conditions.

The company is also aiming to develop more Java frameworks, or profiles, to help developers come up to speed more quickly in the real-time space. This is why Rational worked with Sun Microsystems to add J2ME and Mobile Information Device Profile support to Rational Rose RealTime.

Rose RealTime also now supports Java device developers using Sun's J2ME platform, and significantly speeds development by automatically generating complete Java executables directly from UML designs.

Another new push is to provide Rational real-time tools for the Solaris Operating Environment. One of these is Rational Test RealTime, which automates the testing of embedded, real-time, and distributed applications. This new Rational product manages the tedious and error-prone aspects of implementing, deploying, and executing an embedded test environment. It addresses all test levels, from individual software and UML model components to overall system testing -- including unit, integration, and validation testing -- on various host environments and for any embedded target.

Rounding Up a Java Community

Another piece of Rational's commitment to Java developers can be found online, at a new site called jRoundup.com, which includes one of the largest collections of vendor-neutral Java information on the Web. Hosted and created by Rational, the site features content from experts at BEA, Borland, Sun, and IBM, among others.

"We intend jRoundup to become a favorite resource for the global community of Java developers," said Rational's Greenfield. "Rational and other industry leaders are engaging the Java community as a whole by providing information, content, and discussion relevant to the day-to-day work of Java developers."

The site features several thousand downloadable, and free, applets, servlets, and beans, as well as hundreds of articles. There are short Java tips, in-depth features, information about books, useful links and much more. jRoundup also provides a community and gathering place for software development professionals, including threaded discussion groups and other resources. Customers can submit their own articles and tips for publication.

Lifecycle Support for Solaris

Rational and Sun are also working to deliver a set of e-development tools for customers writing to the Solaris Operating Environment (OE), helping speed time to deployment. In combination, these Rational products and Sun tools and technologies provide developers writing for the Solaris OE
with the first single, unified development environment that supports the full range of Solaris and Java products, including Java2 Platform, Standard Edition (J2SE), J2EE, and J2ME.

With this environment, developers can build on the platform they are using to deploy their software, thereby avoiding the cost of additional testing and transition time. The intent is to help developers speed Java-based applications to market, improve software quality, and reduce total cost of ownership.

The Rational portion of the toolkit includes Rational Suite Development Studio, which features Rational Rose for modeling and Rational ClearCase and Rational ClearQuest for change management and defect tracking, respectively. Also part of the solution for Solaris is Rational Test RealTime, which automates testing of embedded, real-time, and distributed applications.

Models for Java

To help make models available for the Java community, Rational and the Java Community Process recently announced Java Specification Request 26 (JSR-26). It defines a standard mapping between the architecture of Enterprise JavaBeans (EJB) and the Unified Modeling Language (UML). This mapping is called the UML Profile for EJB.

This standard will allow tools from multiple vendors to work together by using a common format for the transfer of models. It sets a standard for how EJBs are modeled and represented in the UML.

"This is a start," said Rational's Greenfield. "We will develop modeling specifications for the entire J2EE platform. This enables us to tailor the models that people build to the target platforms."

"JSR-26 is the way to model a platform-specific design for using EJB. We're also developing mappings between the platform-specific models and the high-level, platform-independent models," Greenfield said.

"We're bringing the tools close to where the developer lives, integrating with the IDE, and then using model-driven development methods to automate engineering tasks," Greenfield said. "This is the basis for our entry into the Java space. We're automating the design, construction, and deployment of J2EE artifacts using JSR-26."

Strategic Partnerships Are Key

No company can go it alone, especially these days -- and Rational is working with four of the leading Java suppliers in the industry to make sure its products and technologies are best-in-class and that the products really work with each other on a deep and meaningful level. It would be impossible to reach this level of integration with the popular IDEs unless Rational were working closely with the owners of the IDEs. Consequently, without these partnerships it would also be impossible to reach Rational's end-goals of raising the level of development abstraction for the industry
IBM

From IBM's perspective, the relationship with Rational spans three business concerns -- marketing, technology, and sales, said Adrian Mitu, Marketing Manager for WebSphere application development tools at IBM. "The first thing we did was to enable forward- and reverse-engineering from Rose into VisualAge for Java."

When that integration "met with quite a bit of success in the market," both companies decided to "look more closely at what is do-able in this area. We ended up creating a relationship," he explained. As part of that relationship, IBM will embed ClearCase LT in future versions of the VisualAge for Java product, Mitu said.

The two companies are also working together on using the Rational Unified Process (RUP) for WebSphere. From IBM's Web site, customers can download a guide on how to develop WebSphere applications using the RUP, according to Mitu.

"The Java community has asked for a couple of things from our Java tools," he explained. "One was support for modeling tools. One of the most important requirements was to support application modeling tools. So, how do you model an application and then start to develop it in Java? And, after you make some modifications, how do you later rework it to an application model? That same argument also extends to data modeling. As you develop the Java application, how do you derive the data models needed to support the running application and have the proper database? These are issues that VisualAge for Java can now address much better because of the integration with Rational Rose."

IBM is also looking into integrations with Rational testing tools. As Java becomes more mainstream, Mitu said, "it's critical to have Java projects managed with the rest of the enterprise. We're improving that by providing better support for external software configuration management systems such as Rational ClearCase. The next frontier is testing: How do you line up integration and system testing in the lifecycle for Java tools? That's currently in the works." Other aspects of testing that IBM is interested in exploring with Rational include stress and performance testing, he said.

"From our perspective, Rational is a solid choice when it comes to end-to-end application development lifecycle support," Mitu said, "from modeling and SCM to testing. They've got all the infrastructure needed for high-quality software development."

Sun

For Sun, "the pieces that Rational helps us fill out are at the front end and back end of the development environment," said Scott Clinton, Group Manager of Software Development at Sun Microsystems. "Things like defining requirements for applications, requirements management, and
modeling tools." Rational tools help Sun's Java customers on both sides of the equation -- in the development process as well as "to validate that the applications are working well. You need to meet the performance requirements of customers," he added.

At this point, mostly what Rational and Sun have "talked about publicly is the integrations" of the tools, Clinton said. In other words, Sun is broadening its IDE and other software to include more Rational solutions, and Rational is extending some of its individual tools, as well as its Rational Suite, to embrace the Solaris OE and Sun's Forte for Java IDE. The two firms are also collaborating on standards for those integrations.

Rational's tools are key now, "especially as Java moves from early adopter to mainstream" in Corporate America, Clinton said. "We need to have more mature tools to help build those Java applications as they become larger and more complex. Process becomes more important because you have larger teams, so you need to leverage the process to make development more efficient. And you need to manage the code and content being delivered."

That said, however, Clinton added, "When you're working with partners, the opportunities are open. Never say never, right?"

**Borland**

The primary work here to date has been to integrate Rational Rose into Borland's Enterprise Studio, Java Edition. Borland also bundles the RUP into its suite.

"Rational Rose provides visual design and modeling capabilities for the Borland customer, and RUP delivers a set of software best practices," said John Carroll, Business Development Manager at Rational. The intent is to launch "other facets" of the relationship in areas outside of this, but these announcements haven't yet been made, he added.

**BEA**

At BEA, the focus is on making sure that Rational's modeling products are working "seamlessly" with the WebLogic Server solution, said Kempton Izuno, Global Alliance Manager for BEA. There has also been a lot of interest, particularly from larger customers and systems integrators, in the endorsement of RUP for J2EE, he added.

Nor will the relationship stop here, Izuno said. "As BEA extends its products, we can see further work with Rational in terms of product integration, interoperability, and field co-marketing."

That Rational is addressing the Java market is "fantastic," Izuno said. "Clearly, a lot of companies have endorsed the Rational approach to developing software, which is language- and platform-independent. This brings Rational's proven methodology to the Java platform."
Online Resources: Rational Java Products and Strategy

Product Information

http://www.rational.com/.../800-024650-000_may032001.pdf  -- A detailed overview of Rational Suite v2001a's new features (66-page .PDF file)

Whitepapers

http://www.rational.com/products/whitepapers/340.jsp  - "Large-Scale Development of Java and C/C++ Applications with Rational Apex"

Community

http://www.jroundup.com/  - One of the largest collections of vendor-neutral Java information on the Web, including thousands of downloadable applets, servlets, and beans, plus hundreds of articles.

News

http://www.rational.com/news/javaone/index.jsp  - Rational's news room, including all the recent product and partner announcements

Rational's Java partners

http://www.ibm.com/software/.../support/rup.html  - How to develop IBM WebSphere applications using the RUP.
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