IBM

TTI Telecom Reduces Costs, Accelerates Development and Streamlines Build Management Using IBM Rational ClearCase®

Overview

■ **The Challenge**
Following a downturn in the telecommunications industry, TTI Telecom faced increased competitive pressure. To compete effectively, the company needed to reduce costs and beat its competitors to market by accelerating development.

■ **The Solution**
TTI Telecom transformed a core business process – software development – by creating an Automatic Build Management System with IBM Rational ClearCase®. Rational ClearCase provides advanced software configuration management capabilities, enabling the company to deliver high-quality releases rapidly and consistently.

■ **The Benefit**
The new system has cut build times down from two days to less than two hours, significantly shortening development time. The company expects to save $2 million per year across all projects and products, while delivering higher quality products to its customers faster.

TTI Team Telecom International Ltd offers advanced, modular and integrated software products and services for Operations Support Systems ("OSS") and Business Support Systems ("BSS") to telecom service providers. With its service assurance, fulfillment and revenue assurance solutions, TTI Telecom is uniquely positioned to bridge legacy and next-generation, network and service infrastructures. Despite its strong position in the industry, a recent downturn in the telecommunications market increased the competitive pressures facing TTI Telecom. The lackluster telecom environment forced the company to look for innovative ways to reduce costs and beat its competitors to market by accelerating development.

With these goals in mind, TTI Telecom began an initiative to transform one of its key business processes – software development. Specifically the company wanted to address inefficiencies in its build and release management processes. Arieh Shalem, Corporate Quality Manager for TTI Telecom, worked with a small team to create an Automatic Build Management System (ABMS) with IBM Rational ClearCase® at its core. Rational ClearCase powers ABMS with advanced software configuration management (SCM) capabilities so

distributed teams working across disparate platforms can quickly and consistently deliver high-quality releases.

The results have been exceptional. ABMS has already cut build times down from two days to less than two hours, significantly reducing the estimated 40 to 50 days per year TTI Telecom engineers would spend compiling and building a single project component. As a result, the system is expected to save $2 million per year across all projects and products, while helping the company deliver higher quality products to its customers faster.

Roni Al-Dor, President of TTI Telecom, reports that ABMS and IBM Rational ClearCase have had a tangible positive impact on the entire business. "TTI's ABMS development is a significant innovation to the build and

release processes and tools utilized for all TTI products and platforms. The idea of a central, Web-based, fully automatic build, supporting all our development languages and platforms, while automating, accelerating the build times and product quality, has saved and will continue to save TTI considerable capital in the coming years," says Al-Dor.

A common problem

According to Shalem, the build and software configuration management issues faced by TTI Telecom are shared by many development organizations. He explains, "In my experience, many companies encounter major issues when they need to build their components and release new versions. I've been with a number of companies, and all of them wasted a lot of time when trying to release a new version of a product. If the build was for different platforms, or used different development languages, then the process was even more difficult. It took a long time, and there was usually just one person who had all the knowledge – how to change or even run the makefile when needed, for example – and when he made a change, nobody else knew what he had done. I wanted to create one standard framework for doing builds in a way that is intuitive to the user. This framework would save time and improve quality because users would not need to handle those manual details and it would save the company money by eliminating the time wasted trying to compile a component which nobody knows how to do any longer."

At TTI Telecom, Shalem notes, build problems were exacerbated by the complexity of the environment. "Our

problems were several degrees worse, because we have a much more complicated environment. We currently support multiple OS platforms including AIX®, two types of Sun Solaris, Windows® NT®, Windows XP, and HP-UX 11. We also develop in a wide range of languages and technologies, including PowerBuilder 6.5, PowerBuilder 9, C++, Java™, CBuilder and .NET."

Complicating matters even further, development teams at TTI Telecom were using disparate tools and processes for version control. One team performed an analysis to estimate how much effort and cost was consumed by builds on a single project. Shalem recalls, "They added up how much time they wasted in a year doing daily and production builds. They calculated it at between 40 and 50 days. They also put it in terms of cost -- it was a half million dollars worth of wasted time. That was on a single component, and we have over 60 components and projects in development."

IBM Rational ClearCase and ABMS

With a mandate from TTI Telecom's CEO, Shalem began working on ABMS. The decision to use IBM Rational ClearCase was based on Shalem's success with the tool as an effective software configuration management for any size team with support for multiple platforms including Windows, Linux®, UNIX® and mainframes. Shalem has been impressed by a broad range of features offered by Rational ClearCase including integration with defect and change tracking in IBM Rational ClearQuest®, support for parallel development, and the simplification of key SCM functions through Unified
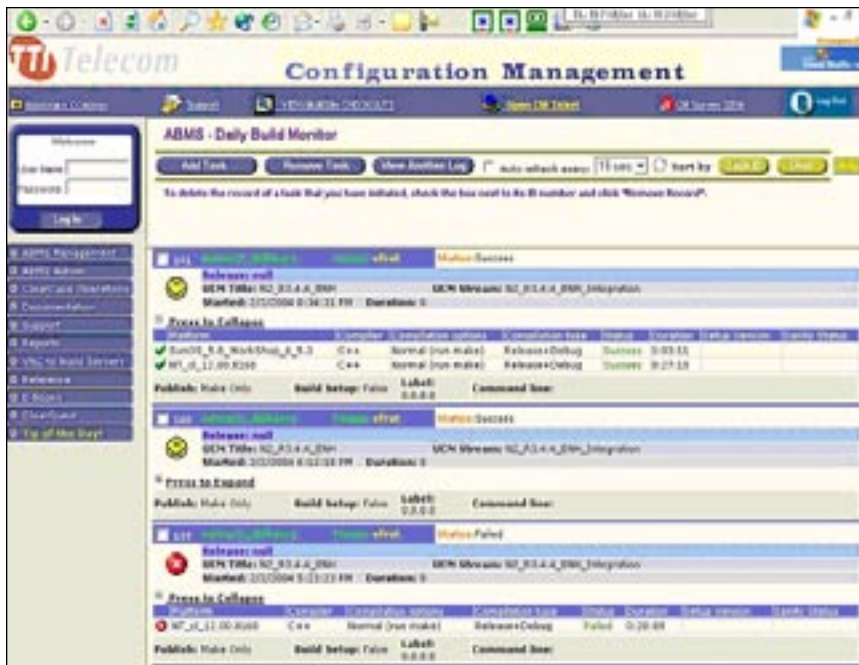
Change Management (UCM). "In my opinion, Rational ClearCase is the best software configuration management tool available in the market today," notes Shalem.

For the ABMS project, however, it was the flexibility of IBM Rational ClearCase that played a key role. ABMS leverages the Rational ClearCase API to bring together Rational ClearCase functionality with a Web-based front-end and an external database. Shalem explains, "We wanted to tie everything together into one system that would run smoothly. So my idea was to create a database that works outside of Rational ClearCase, but interacts with it, and a Web interface for the user. We also created a build farm with clustered and high availability servers that get build tasks from the system. For example, when a user logs into the system and wants to compile product X on platform Y with several parameters, the build farm will automatically know what to do and provide constant updates to the user. I also added a scheduler to the system so tasks can be run on nights and weekends. All of that is enabled by Rational ClearCase and its API."

Realizing the benefits
Shortened build time across applications
Although development on ABMS is ongoing and TTI Telecom is in the initial stages of implementing ABMS on its many development projects, early results have been outstanding. "We had one component that required about two days to fully compile and release a version on all platforms. Now it is running in one hour and forty-five minutes including all the setup, builds, and sanity tests. After

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a build is completed, the system analyzes the results and emails a report to the user that shows all the UCM activities that were included in that build. It also includes the results of the sanity test -- if one is available -- that says which tests completed successfully, and which failed. The system also generates a full build log which is stored in Rational ClearCase and version controlled. It is all done automatically in less than two hours – and less than 10 minutes for smaller components – during which the developer can continue to work without interruption."

According to Shalem, the most technically challenging aspect of the project was implementing a method of automatically performing builds of Sybase PowerBuilder applications. "I think it is a unique capability, I have never heard of anyone else who has done it. We shortened the manual build process for PowerBuilder which used to take six hours down to one

hour, and it is done automatically. And now, because everything runs on Rational ClearCase we have a lot of information about component dependencies that we didn't have before."

50 percent reduction in development time

With all the time-savings that ABMS and Rational ClearCase provide, TTI Telecom development teams have been able to shorten the development lifecycle on a key project by more than 50% -- effectively cutting their time to market it half. "In the first four months that ABMS was implemented on that product, the developers released two formal versions, and had 30 daily builds. Without ABMS they would typically be able to release only one full version in that time. They are at least twice as fast. The owners of that project are very happy because so much time was being wasted before, and now everything runs automatically," says Shalem.

Increased developer productivity

Increased developer productivity also contributed to the significant acceleration in development. Because IBM Rational ClearCase is integrated into IBM WebSphere® Studio, TTI Telecom developers can access Rational ClearCase directly from their IDE.

TTI Telecom is also using IBM Rational ClearCase MultiSite® to support parallel development for a development team that spans two continents. With Rational ClearCase, Shalem points out, TTI Telecom's approximately 180 developers have a flexible, efficient tool that provides insight into the development process that the team had previously lacked. "Rational ClearCase makes it easy to know what you are doing. Using a version tree, for example, a user can see exactly where he is in the development stream. With other tools sometimes it is very hard to know where you are or exactly what you are doing. Rational ClearCase is very fluid; you can go from wherever you want to wherever you want."

Consistent, integrated change management process

Rational ClearCase is an integrated part of daily development at TTI Telecom. In addition to the integration with IBM WebSphere Studio, it is also seamlessly integrated with IBM Rational ClearQuest so developers always have instant access to new, prioritized change requests. There is an initiative underway at TTI Telecom to standardize on UCM. "We want to move everyone into one standard UCM development process using Rational ClearCase and Rational ClearQuest," notes Shalem.

In addition, developers use Rational ClearCase to manage a range of software assets, including visual models from IBM Rational Rose® and IBM Rational XDE™. And, Shalem has plans to integrate with IBM Rational TestManager and IBM Rational Robot for automated testing. Shalem adds that ABMS has already become a home base for TTI Telecom's QA team, who monitor it daily to see what builds have been completed, and what is scheduled for the near future.

Looking forward

With potential cost savings in the millions of dollars per year, and the ability to slash delivery times, TTI Telecom is eager to adopt ABMS and Rational ClearCase across as many projects as possible, as rapidly as possible. "Our CEO has said that upgrading SCM processes and tools is the most important project of this year – ABMS and Rational ClearCase are keys to that upgrade. It's a company decision to push very hard this year, to make sure that it happens," says Shalem.

IBM Rational ClearCase is helping TTI Telecom become more responsive to its customers in many ways – including faster updates, and higher quality products. Shalem notes that using Rational ClearCase is a signal to customers that TTI Telecom has a mature development process in place. "Our biggest customer specifically asked for all of the projects associated with them to be managed with Rational ClearCase and nothing else. I know they are using Rational ClearCase as well. They see its value, and they want to ensure that when they get a new release that it has been managed correctly."

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