

Trane Smoothly Transitions to C++ Aided by Parasoft's Development Testing Platform

Trane (NYSE: TT) is a world leader in air conditioning systems, services, and solutions. They provide highly reliable and energy efficient comfort in commercial, industrial, institutional, and residential buildings throughout the world.

The Trane Global Modeling and Analysis team determined that moving to object-oriented development would ultimately enable more rapid and agile responses to business demands. By adopting C++ as the company's primary programming language, Trane could support a more component-based architecture for their code, which could be shared among numerous computer models. To help achieve this goal, Trane implemented Parasoft's Development Testing Platform.

Migrating from a Legacy System to C++

The Global Modeling and Analysis team is spread across three different locations: La Crosse, WI; Chicago, IL; and Shanghai, China. Some of these engineers work on code using C++ and VB.NET. Others work on mathematical models. The La Crosse group is responsible for the mathematical models.

The code for Trane's mathematical models is based on engineering rules, which changes very little over time. As a result, the legacy system had remained highly reliable for an extended period. Engineers wrote equations over the course of many years and the derived forms are relatively stable.

Even so, the advantages of moving to object-oriented development outweighed holding on to their legacy system. In addition to sharing components between their many computer models, the transition would enable the Global Modeling and Analysis team to integrate their in-house tools with multiple user interfaces—optimizing resources.

Finding a Quality Solution that Goes Above and Beyond Code Review

The Global Modeling and Analysis team created a list of coding standards to ensure that the code met uniform expectations around reliability, performance, and maintainability as they transitioned to C++ and .NET. To remain compliant with Six Sigma, Vikas Patnaik, Manager of Global Modeling and Analysis team, sought a process to validate the use and control of the new coding standards.

After researching code review methods, Jim Spielbauer, Trane Development Engineer, discovered that the manual code review processes were likely to impact the project schedule and budget, which led to the question: Is there any way to automate code reviews?

With a weighted list of features that focused mostly on verifying coding standards, Spielbauer and his teammate, Senior Software Developer Mike Eastey, started their search for automated testing software. They came across Parasoft's Development Testing Platform for C++ and .NET applications.

Spielbauer says, "Our list of desired features got bigger when we found Parasoft's solution and realized its capabilities." They were specifically drawn to automated unit testing, which allows them to start verifying the code's reliability and functionality as each logical unit is completed. As a result, the length and cost of their downstream processes, such as debugging, are reduced.

Spielbauer states, "When we went into this, automated unit testing was something we didn't realize we could get. Even though it wasn't part of our criteria at the beginning, discovering we could get automated unit testing was a pleasant surprise."

The platform's integration with Visual Studio .NET, which enabled the engineers to test the code directly in their development environment, was another pleasant surprise. The engineers could develop code, then just click a button to test it with no additional project setup. Eastey remarks, "The fact that Parasoft's solution can also integrate with Visual Studio .NET is a huge bonus."

Spielbauer adds that, "It's an important benefit that Parasoft solutions can work with both C++ and .NET languages. Parasoft provides a quality development solution that our entire team can grow with and experience continuous improvement."

Transitioning with Ease

Deploying Parasoft's Development Testing Platform eased the Global Modeling and Analysis team's migration to C++ at a level that is both manageable and encouraging.

Because much of the team is new to C++, running their code through the platform's C++ analysis component helps them learn best practices and techniques. Spielbauer states, "Since I am so new to C++, I do tend to make mistakes. Parasoft finds those errors early in the software development process. It enables me to fix the code before it reaches our users."

He continues that Parasoft's Development Testing Platform "is teaching us all to be better programmers. It helps us find errors that we didn't even realize were errors."

Spielbauer can create reusable tests and run them with nearly 100% coverage. The tests not only help him and his team expose structural errors as they are introduced, but also establish a regression test suite that determines if code modifications impact existing functionality.

Spielbauer explains, "Parasoft's solution has saved the Global Modeling and Analysis team both time and resources that we would have otherwise spent finding and fixing defects. Instead, we get to spend that time adding new features and functionality."

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