# Parasoft Helps TransCore Ensure the Reliability of their Toll-Road Payment Collection Systems

TransCore, LP and its subsidiaries provide technology-based services and products that enable its customers to efficiently manage ground transportation systems, assets, and transactions. With installations in 39 countries, more than 80 patents, and an ISO 9001:2000-certified manufacturing, research, and design center, TransCore's expertise is unparalleled in the ground transportation services industry. TransCore employs more than 1700 people with key research and development sites in San Diego, Atlanta, Dallas, and Albuquerque. A leading provider of toll systems, with experience in the design, development, integration, installation, or maintenance of nearly 4000 lanes worldwide, TransCore pioneered the application of radio frequency identification technology for the transportation industry, installing the first electronic toll collection system in North America in 1989.

## The Problem

TransCore's product offerings address critical business operations, which require a high standard of quality and performance in the underlying software. Many of TransCore's contracts require custom software development to adapt their products to specific contractual needs. Meeting the demand for both high quality and performance, while maintaining aggressive project schedules across multiple software development efforts, is a significant challenge. TransCore found that the necessity of using key software resources to identify and fix errors was prolonging product development and impacting the company's ability to maintain the established schedule. The company needed a way to ensure its rigorous commitment to software quality without prolonging development and increasing its staffing.

Giorgio Frondoni, a software manager for Transcore, realized that the company would benefit from a better means of automating its software testing. Also, the earlier in the development process that his team could recognize and remedy software errors, the greater confidence he would have in meeting the company's time to market and quality commitments.

## The Solution: Parasoft Development Testing Platform

Frondoni's solution was to employ Parasoft's Development Testing Platform with Parasoft Jtest. This platform supports the concept of Automated Defect Prevention (ADP) by automating practices such as unit testing and static analysis. ADP advocates that the root cause of each error be identified, not only allowing the error to be fixed but also allowing the element that caused the error to be addressed and modified--preventing that same kind of error from re-occurring. ADP involves the automation of five simple steps:

1) Detect an error
2) Isolate the cause of the error
3) Locate the point in the process that created the error
4) Implement practices to prevent the error from reoccurring
5) Monitor for improvements

Frondoni had worked with Parasoft at a previous company and was familiar with the product and its ability to provide automated unit testing and static analysis.

Frondoni explains, “Parasoft enhances our ability to achieve our software quality and performance goals while meeting the established timelines. Parasoft allows us to reduce errors at the source, adjust our practices as necessary to eliminate a repeat of that error, and improve our overall software development process that carries forward from project to project. With Parasoft, we get not only testing automation but the ability to store and track test results to measure and monitor our performance and use that information to progressively improve our development process. That is where we save real time and money in the long run.”

Many components of TransCore’s automated toll collection system are Java based, making Parasoft Jtest a perfect solution for ensuring their quality. The system interacts with lane control equipment at toll plazas, generating toll collection transactions for payment by credit card, ACH or cash. The information is then used for traffic and revenue analysis, which is shared with customer service and other business units. Frondoni uses Jtest to unit test all of the back office components of the system.

Through the unit testing and coding standards enforcement provided by Jtest, TransCore has made automated testing an integral part of its daily software development process. It has seen a significant reduction in coding errors that used to extend its quality assurance cycles and jeopardize its project timelines and deliverables. “Jtest helps us to unit test our code,” said Frondoni. ”It helps prevent problems from being propagated to the next level, which could be very expensive to fix on every project. TransCore is contractually required to go through extensive pre- and post-deployment system testing. Software errors causing system failure at this stage of testing could have a huge negative impact.”

Parasoft also helps Frondoni better manage his development resources by providing him with information about developer activity and progress. “With Jtest, I get summary data such as how much new code has been created, how many new test cases were generated, and test case success and fail rates by developer, by code module and by error type. Using the data, I can objectively evaluate and compare how the project code base is progressing and how each development group is doing against its goals. I can measure progress and identify potential problem areas to resolve them quickly,” he said.



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