# Cisco Unifies Software Development and Quality Assurance through Parasoft API Testing

Cisco's Datacenter Switching and Security Technology Group (DSSTG) sought ways to automate its testing infrastructure and further enhance software quality. Given the reliance of its Global 1000 clients on highly secure solutions to support their own composite applications, DSSTG wanted to significantly enhance its testing coverage and productivity without increasing the time and resources necessary to deliver these gains.

With Parasoft API/Cloud Testing, DSSTG's software developers and quality assurance (QA) experts working together have been able to jointly create, use and share test assets resulting in a 25% increase in test coverage and a 50% increase in test case productivity. Through test-driven development, they have rapidly delivered a quality, mission-critical product that is highly valued.

## Challenge: Enhancing Development, Expanding Test Coverage

DSSTG has little margin for error. Clients rely on DSSTG for quick and efficient deployment of composite applications. Given the sensitivity of these applications and infrastructure, client demands and expectations are exceedingly high.

To meet these expectations, DSSTG set similarly high expectations for itself in terms of software development and quality management practices. "DSSTG products are used by enterprise customers that depend on us being up 24x7 and protecting them from back-end attacks," explains Konstantin Goldin, QA Director. "So the high quality of our product is a given."

DSSTG knows that advances in software development and quality come from new thinking, enhanced approaches and automated infrastructure, not from simply throwing more people at these challenges. Test- driven development, a forward-looking software design technique brings developers more deeply into the realm of quality control and assurance. DSSTG decided that it wanted to embrace this technique and turn it into standard practice.

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Test-driven development involves first writing a test case and then implementing only the code necessary to pass the test. Through rapid feedback, the approach ensures that software defects are addressed early in the process when they are least costly to fix.

DSSTG had a home grown integration testing framework that accepted test cases in Java syntax, and the company was clear about its limitations from a software testing perspective. The development and QA teams wanted to add more test cases and increase their testing coverage. But existing tools were less than intuitive and required a great deal of reiteration among developers.

"Unfortunately, you had to constantly repeat your testing efforts," adds Goldin. "You do some manual testing when you are accepting a feature. Then you would write your integration tests using Java."

The existing tools also placed limitations on the productivity of QA people as they had to continuously invest time in increasing Java knowledge limiting their ability to write new test cases or scale the learning curve associated with current testing practices and expectations.

QA was most focused on increasing its testing coverage, particularly for regression testing. "This was very important from a QA perspective," says Ramalakshmi Vijayakumar, a lead QA engineer. "The developers write test cases to test features. Then, we add more test cases to the existing testing suite or make our own test cases. We needed to run positive and negative cases and test them out. The demands are significant in order to fully test the features."

## Action: Leverage Parasoft to Transform Development and Quality Practices

Having used Parasoft SOAtest in the field for several years to demonstrate the value and impact of its gateway solutions to customers, DSSTG eventually decided to begin leveraging the same platform to transform its software development and quality practices. Over the past year, it has been employing Parasoft SOAtest and has recently customized the solution to become a central part of a larger testing framework.

As a result, Parasoft SOAtest's API testing is not only used by QA experts, but by software architects and developers as well, demonstrating the power of Parasoft SOAtest to span boundaries and provide business value on many levels.

## Results: Unifying Development and Quality Assurance

Parasoft has had a powerful impact on DSSTG's software development and QA operations. It has not only unified the two groups, it has streamlined their processes and raised their performance to new levels.

For instance, they made significant progress in instituting a test-driven development approach among their developers. Goldin describes the approach as "very straightforward." As he explains, "Developers define what a feature is supposed to be. Then, they implement the test cases that will exercise the feature appropriately. They ensure the tests are passing and that they are not regressing any of the functionality. 

"By the time the developers are done, they have the feature fully created and they have a fully developed integration test that they can add into the integration test framework – and they are done. They don't have to spend time writing additional tests."

This has led to notable productivity and quality gains. "Finding bugs in already implemented features is much costlier than finding bugs in a feature as you go," he adds.

"With Parasoft we are able to kill two birds with one stone," says Goldin. "You test the feature. When you are satisfied with result, you immediately generate a regression suite and you have your automation ready. You don't have to do the testing twice anymore. It's all done in one shot. That's a huge advantage."

What's particularly notable, however, is the unification of software development and QA processes. Now, tests created by developers are reused by QA. Once the tests are handed off, QA testers extend them and create additional tests, adding them to the existing set of regression test assets.

Testing coverage also improved. In fact, the QA team points to a 25% increase in testing coverage, particularly in relation to regression testing.

"We were able to increase coverage with the same number of resources and with the same amount of time allocated," says Vijayakumar. "We got more payoff for our efforts."

The QA team now runs its entire regression test suite once daily to obtain consolidated results. These results provide a comprehensive functionality snapshot based on all the tests, allowing the team to know exactly what is working correctly and what is not. With this full visibility into software quality, DSSTG is able to engage in an early detection of regressions. "Regressions don't stay in the build very long," says Goldin. "They are addressed early on, which reduces costs and improves productivity."

As a further benefit, he notes that the QA team is able to spend more time on new features and less time worrying about old features. "It becomes a very positive cycle," he says. "When a new feature is introduced into the product, you only have to create tests for the new feature, and that test creation is automated, so you really have more time to spend developing the new features. And when you get to the release, you only have to worry about the current feature set. There is less rework."

Another area of benefit is in the production of test cases. Both developers and QA testers can now easily produce new test cases to determine that software requirements are met. Having ported hundreds of new cases to Parasoft SOAtest in the software requirements are met. Having ported hundreds of new cases to Parasoft SOAtest in the earlier in the year, the QA group estimated that related productivity had risen 50%. "The issue is not just the time it takes to make new test cases, but the ease of making them," says Vijayakumar.

Now, developers and QA testers work much more closely to ensure that software quality remains extremely high and that shipped products never include regressions.

"Before, we used to have one integration test suite, which was developer driven," says Goldin. "Now, we have two integration test suites. One is a developer test suite to catch immediate regressions. Another, more elaborate, is the QA test suite which covers a lot more regression ground – with many more test cases added." Finally, the DSSTG team cites benefits from Parasoft in terms of testing security. In one case, it was able to isolate a hidden bug in a new feature that otherwise would have been very difficult to find. In fact, security testing does not need to be held back until the end and treated as an audit-only practice.

At DSSTG, it has become part of a disciplined and far-reaching overall quality process. "We have used Parasoft to do extensive security testing," says Goldin. "It has helped us uncover potential security vulnerabilities. Now, QA can cover security from A to Z."

Ultimately, Parasoft's automated test infrastructure has had a powerful impact on DSSTG. It has unified development and quality insurance processes, helping the groups create and reuse test assets. It has raised productivity. And it has enhanced overall software quality practices – ensuring that DSSTG remains a valuable solution provider to its highly demanding clients. "Parasoft helps us increase test coverage and increase the granularity of our testing," says Goldin. "That helps us ensure our clients that they are always receiving a very high quality product."



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