

CASE STUDY



Alcatel-Lucent Improves Code Quality with Synopsys Static Analysis and Software Test Optimization



Business overview and challenge

Alcatel-Lucent is a leading global provider of telecommunications solutions with products covering IP and cloud networking to ultra-broadband fixed and wireless access. With over 70,000 employees, Alcatel-Lucent provides technology to virtually all major service providers worldwide.

A key division of the company is the Small Cells Business Unit, which develops ultra-small base station products supporting both 3G and 4G mobile

networks. These devices allow users to obtain better signal in areas where network coverage or capacity has historically been poor, such as inside large buildings, in remote homes, or within crowded stadiums.

Due to their role in the network, Alcatel-Lucent products have to have the highest levels of reliability, ensuring customers are never without service. Ian Jordan, Senior Technical Manager at Alcatel Lucent comments, "Our products simply have to have the reliability that service providers need to deliver excellent service to customers. When a telecoms service is offline for an extended period of time it can make national news. More importantly, things like emergency calls might not be possible. As a result, high availability has to be a top priority for all our products."

The need for high reliability and availability means that Alcatel-Lucent has to rigorously test all products at every stage of their development. This is an expensive process to complete within the short release cycles required by the rapidly expanding Small Cell market. Software code is no exception to this process and, with millions of lines of code involved, it must be checked comprehensively to ensure that there is a minimum number of defects. With set deadlines in place for the delivery of products, accurately predicting the quality of the code within a product is key to the development process.

Due to the nature of their market, any tool that speeds up the testing process, reduces costs, and improves code quality is invaluable to the delivery of high availability products. Predictability is another key need, as other parts of the wider business are dependent upon the Small Cells unit hitting its deadlines in order to meet customer commitments. Given this range of complex pressures and demands, Alcatel-Lucent selected the Synopsys Static Analysis (Coverity) tool to support the production of its small cell products.

"By using Coverity [Synopsys Static Analysis] and Test Advisor [Synopsys Software Test Optimization], we are ensuring that the code we deliver in our 3G and 4G Small Cells to customers is of the highest possible standard, ensuring consistent reliability and performance."

Ian Jordan
Alcatel-Lucent

Solution evaluation

When the Synopsys Static Analysis tool demonstration was reviewed in the product evaluation process, irregularities were picked up that weren't being picked up by other tools. Ian Jordan goes into further detail by commenting, "Initially when we looked at the results from the Synopsys Static Analysis tool, we didn't believe them and they seemed incorrect. But on closer examination we found that Synopsys Static Analysis was identifying issues that were extremely difficult to spot from basic analysis. This gave us real faith that the

solution would be able to support our long term testing needs."

Following the introduction of Synopsys Static Analysis, Alcatel-Lucent subsequently began utilizing Synopsys Software Test Optimization (Test Advisor) to target specific areas of the code base that were difficult to validate before introducing to the field. In tandem, the two products helped Alcatel-Lucent save time and money in the lengthy process of meeting customers system availability targets. Crucially, the development process has given the Small Cells Business Unit a new level of predictability to product development.

Synopsys Static Analysis deployment and benefits realized

With a large number of developers spread across the globe working on a particular project at any point in time, the introduction of Synopsys products has made a significant impact upon the small cells business. The integration of Synopsys Static Analysis in 2008 and Synopsys Software Test Optimization in 2013 enabled an organizational shift to an agile development process, with automated testing of code by Synopsys products every night. As a result, around 500 new tests and over 50 product changes have been made to the product code to date through Synopsys Software Test Optimization, in addition to defects found by Synopsys Static Analysis.

"Both Synopsys products have improved the quality of the code in our Small Cells family and ultimately this enables us to deliver a higher quality product to the customer as we are 'Synopsys clean,'" Jordan highlighted.

Benefits have continued long after the first installation of Synopsys Static Analysis, as Ian Jordan details, "When we first ran Synopsys Static Analysis, it helped to find the cause of some memory issues we had identified during testing. The addition of new C++ checkers makes the testing process even more rigorous."

The use of Synopsys solutions has also helping developers within the Small Cells business, "Synopsys Static Analysis and Software Test Optimization are really helpful as tools to drive our standards to an even higher level," Jordan commented.

Conclusion

Reliability is of paramount importance to Alcatel-Lucent's Small Cells business and as a result the quality of its code has to be of the highest standard. The ability to automate testing ensures that the organization delivers products to customers that they can rely on time after time. Through Synopsys Static Analysis and Software Test Optimization, the business unit is now better able to predict and manage the entire release process, understanding codes areas that need addressing throughout development, not just at the end. This improves the time to market of all products and serves to improve the competitive advantage.

BUSINESS BENEFITS

More predictable development process

By testing code on an ongoing basis it is now easier to identify and rectify issues as they are found, avoiding costly delays at the end of a project.

Improved reporting processes

Synopsys Static Analysis and Software Test Optimization gives Alcatel-Lucent greater insight and visibility into the quality of the code, improving the overall reporting process.

Increased operational efficiency

By automating testing, Alcatel-Lucent has seen improved efficiency with less time spent manually testing code and more time spent on delivering innovation in the product.

THE SYNOPSYS DIFFERENCE

Synopsys offers the most comprehensive solution for integrating security and quality into your SDLC and supply chain. Whether you're well-versed in software security or just starting out, we provide the tools you need to ensure the integrity of the applications that power your business. Our holistic approach to software security combines best-in-breed products, industry-leading experts, and a broad portfolio of managed and professional services that work together to improve the accuracy of findings, speed up the delivery of results, and provide solutions for addressing unique application security challenges. We don't stop when the test is over. Our experts also provide remediation guidance, program design services, and training that empower you to build and maintain secure software.

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