Case Study: Overture

A Proactive Approach to Quality Assurance

OVERTURE

WEBSITE: WWW.OVERTURENETWORKS.COM
INDUSTRY: CARRIER ETHERNET SOLUTIONS

Overture – a leading developer and manufacturer of Carrier Ethernet edge and aggregation equipment – has implemented a zero-tolerance policy for in-field failures of its network devices. In fact, the company even aims to eliminate issues found during testing that could have been identified during development and corrected early. To support this proactive mindset, Overture is always looking for opportunities to modernize its approach to its software development processes.

Recently, after an in-depth tool comparison and trial project, Overture selected Klocwork Insight™ to help meet its progressive quality assurance goals.

Sophisticated Source Code Analysis

As Daniel Martin, Software Engineer at Overture, explains, the company wanted to find out how much it could improve its software quality processes. “We have always made source code analysis part of our development process and we did light analysis using CPP Check, but there is a wide array of issues that this tool doesn’t catch, and bugs did make it into builds. So, we started to look at a more advanced solution.”

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Daniel Martin - Software Engineer

With the goals of eliminating any issue that could take a network device down in the field – and reducing the number of defects discovered during testing – Martin and his director, Matt Furnari, undertook a project to select and introduce a robust source code analysis (SCA) tool.

As Furnari explains, “Field outages and device downtime have a direct impact on future sales and brand integrity. It also takes time to investigate software issues, and we said, ‘if there is a tool that can catch an issue before it causes an outage, then we simply must have that tool.’”

Choosing the Best Tool for the Job

The development team found that CPP Check was capable of finding certain memory overrun-type defects – but, says Martin, “It could find only a small subset of those issues.” He tested two commercial tools, including Klocwork Insight, on a specific Overture product line.

Ultimately, the decision came down to which tool could detect the greatest number of the most severe issues. To assess this during the comparison-trial period, the team used a creative method of "log-test-trace" to identify the probability that a detected issue from one of the two tools would lead to an actual failure. Each time a detected bug was fixed, the developer included a log statement in the revised code. During lab testing, if the fixed code ran, the benign statement would appear to let the test team know that, "*If we hadn't made Bug Fix X, Error Y would have occurred here*." These instances were documented by the test lab.

Furnari reports that, "Using our log-test-trace methodology, it was determined that Klocwork Insight found several times as many real issues as its competitor. The results of this real-world failure analysis played heavily into our decision."

Overture has also found that Klocwork Insight's default configuration works well in its development environment, leading to very little additional tool customization. Martin explains: "We considered tweaking the severity level of some of the complex issues where the root cause is sometimes subtle, but in the end we have kept the Klocwork Insight default settings so that we don't miss anything that could impact device performance."

Roll-Out and Implementation

Acceptance of Klocwork Insight among Overture's development team has been strong, according to Furnari. "It's clear that the kinds of problems Klocwork Insight is finding are things that need to be looked at, and developers want to ensure their code is as clean as possible."

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Matt Furnari - Director, Software Engineering

"We have also been pragmatic in our approach," he continues. "We didn't try to clean up everything at once. We have made the tool available for all products so developers can proactively go in and see what's going on with their code at any time, and then we periodically target specific code bases to aggressively reduce their Klocwork backlog."

When the decision is made to get the bugs out of a particular product, Overture assigns resources to review the Klocwork reports and reduce the backlog of defects in order of severity/priority. In addition, Klocwork Insight is now run at build time on every new product developed, and engineers are sent emails to notify them when issues are detected during a build – with the goal of not introducing new defects going forward.

Although Furnari has not mandated the use of Klocwork Insight at any particular stage of the development process, he says that many developers are requesting the desktop tool. "Klocwork Insight has proven that it can avoid long investigations after a problem is identified in the field – proving to our engineers that it is a valuable tool."

"When the developers come to us for more information about a bug that is found, we use that opportunity to encourage them to start using the desktop tool," Martin adds.

He recalls one engineer's early experience with Klocwork Insight as an example. "One of our guys fought an issue for more than a day. Then he looked at the Klocwork Insight report and realized that he'd have saved that day if he'd used Klocwork Insight first! So it's not a tough sell."

Quantifiable Results

After just six months of use, Klocwork Insight has become an integral part of the software development process at Overture. The tool is now installed on multiple product lines, and the development team chooses specific products to focus on based on need and development schedules.

The trial period focused on one key product line: “We began at 5 issues per 1,000 lines of code,” Martin recalls. “And after the trial period, we had knocked out about half of those issues.” Impressively, within just a few months of use, Klocwork Insight had resolved a major field issue that the company was dealing with. Even more critically, “Klocwork Insight also found three other bugs that had caused several field outages – this is a very significant achievement for us,” Furnari says.

Overture’s second debugging blitz focused three developers on another product line over the course of one month. “That code base started with 2.39 defects per 1,000 lines of code and today we’re down to 0.14 per 1,000 lines of code,” Martin reports.

Future Benefits with Klocwork Insight

To date, Overture has achieved excellent results with Klocwork Insight’s default checkers, but those settings represent only a portion of the tool’s entire capability. Once the development team has cleared the backlog of Klocwork-detected defects throughout its products, they will be able to activate more checkers deeper in the Klocwork library for additional results.

With the goal of using Klocwork Insight on all code developed at Overture, the tool has been introduced to a third product line and plans are also afoot to use Klocwork Insight on a new code base that was inherited during a recent merger. Martin concludes: “At Overture, we have undertaken an effort to reduce the number of Klocwork Insight findings on **all** of our products, with the hope that we will avoid outages in the future.”

About Klocwork

Klocwork helps developers create more secure and reliable software. Our tools analyze source code on-the-fly, simplify peer code reviews, and extend the life of complex software. Over 950 customers, including the biggest brands in the mobile device, consumer electronics, medical technologies, telecom, military and aerospace sectors, have made Klocwork part of their software development process. Thousands of software developers, architects, and development managers rely on our tools everyday to improve their productivity while creating better software.

About Overture

Overture provides an entrance to a smarter network. We are the preferred Carrier Ethernet edge and aggregation partner to more than 450 service providers and network operators worldwide. With Overture, customers can leverage Carrier Ethernet to multiply revenue and streamline operational costs by enabling high-capacity Ethernet services over any physical media, including fiber, copper and TDM. Overture’s solutions are recognized for being reliable and easy to use, arming customers to compete in demanding applications such as cloud computing and mobile communications that require greater bandwidth and smarter networks. Overture is headquartered in Research Triangle Park, NC, with a technology center in Richardson, TX. For more information, visit http://www.overturenetworks.com.

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