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Tocarema powers up

SUN STUDIO 12 PROVIDES THE STARTUP TOOLS FOR AN AUTOMATED TRADING SYSTEM

By Jeffrey Burt

TWENTY MILLISECONDS WASN'T FAST ENOUGH.

When the founders of Tocarema started talking about building a company dedicated to building software and tools for automated trading environments, they knew they needed to build a platform that would offer a latency much less than 20 ms, said Joakim Johansson, a founding partner and chief technology officer for the Stockholm-based startup.

"There's a huge need in the market for automated trading," Johansson said in an interview with eWEEK.

The group wanted to take a fresh start with this company, creating something custom-made for the automated trading space rather than building on offerings that were already in the market. To do this, Tocarema is relying on technology from Sun Microsystems, including servers powered by the vendor's multicore UltraSPARC chips, the Solaris operating system and Sun Studio 12 developer tools.

The key to the infrastructure, Johansson said, is performance. The platform the company builds and the

automated trading software it creates must hold up under the demands of traders who are demanding a latency of about 1 ms or less between the time a decision is made and an action is taken.

"For these kinds of systems, performance is key," Johansson said. "Performance is something that needs to be built into the DNA of the system. It's



Tocarema is creating an automated trading system.

not something you can add on later."

Ten to 15 years ago, trading traditionally took place on the trading floor, with

people yelling back and forth, Johansson said. It's since evolved to electronic trading, where traders use computers, though it's still

CASE FILE: Tocarema

▶ **Business problem**

The startup was building a high-performance automated trading platform from scratch and needed the technology that would drive the platform; latency had to be approximately 1 ms or less

▶ **Recommended solution**

Deploy Sun multicore server systems, using the vendor's Solaris operating system for multithreaded capabilities; use Sun Studio 12 developer tools to help create multithreaded applications

▶ **Time frame**

Development of the platform began earlier this year; currently in a limited testing phase, with an expanded launch expected early next year

▶ **Return on investment**

Early indications are that the platform is working well in tests at two customer sites

the human making the decisions. In these scenarios, a 20-ms latency between the time the decision was made and the transaction occurred was acceptable, since everyone else was in the same boat. Everyone else had a 20-ms delay.

The move now is toward automated trading, where software handles much of the decision making, with the trader being the manager of the software and latency dropping.

“Suddenly 20 milliseconds is too much,” Johansson said. “Twenty milliseconds is an ocean of time when the software is the decision maker. Performance needs to be built [into the system] with software as the decision maker. ... To keep that [1-ms latency], you have to be able to do it more than just one time, but 200,000 times in a row. It needs to be that fast every time.”

Tocarema officials wanted to take advantage of the parallel processing capabilities coming onto the market and turned to Sun. The vendor has the multicore machines, an operating system that can take advantage of multicore environments and developer tools that can generate code that gives the level of performance needed and makes multithreaded programming easier.

The Sun developer tools also support 64-bit computing and offer measur-

ing and analysis capabilities to ensure applications are running correctly.

Sun, of Santa Clara, Calif., rolled out Sun Studio 12 in June, and Kuldip Oberoi, product line manager of developer tools and emerging technologies at Sun, said the company is still getting feedback from customers on it.

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—JOAKIM JOHANSSON

Oberoi puts the benefits of Sun Studio 12 in several areas. One is the performance of applications developed with these tools, which include various compilers to help developers build applications and monitor their performance. Modeling capabilities and the static analysis of threads are among the features that enable programmers to create parallelism in their code to take advantage of multicore environments.

“Writing multithreaded code is not easy,” Oberoi said. “It wasn’t easy a decade ago. It’s easier now, but still not that easy.”

Such support for multithreading was a selling point for Tocarema, Johansson said. “Many tools today do it, or do it to some extent,” Johansson said. “But not all are as robust [as Sun Studio 12].”

Features such as Sun’s Deadlock and Data Rate offer developers the capability to run applications and find and correct problems, Johansson said. Sun Studio 12 also features support for OpenMP, which is becoming the standard for parallelizing applications and can be used in multithreaded programming for C, C++ and Fortran programs, Oberoi said.

In the productivity realm, Sun Studio 12 offers a host of debuggers and performance analyzers and such features as a new IDE (integrated development environment) for NetBeans 5.5.1. The tools also offer support for a variety of platforms, including Linux, a move fueled by the growing number of platforms.


“We live in a heterogeneous environment, and we have a lot of customers who want to use these tools” within multiple platforms, Oberoi said.

Johansson said Tocarema engineers needed a way to measure the performance of the applications they were developing, and Sun Studio 12 gave them those tools. Those measuring

capabilities include support for DTrace, a feature in Solaris that lets developers monitor and analyze applications, and DScripts, scripts written in DTrace’s C-like programming language. The technology is less intrusive than other measuring tools, he said.

“DTrace is extremely helpful,” Johansson said. “When you measure something, when you put a probe into it, it affects performance. DTrace allows you to measure without putting a big probe into what is being measured.”

Tocarema began operations Nov. 1, 2006, and started building out its technology offerings earlier this year, Johansson said. The goal is to offer customers the technology needed to conduct automated trading. The company, which opened a development office in St. Petersburg, Russia, in February, is testing its software and platform at two customer sites, and Johansson said he expects the company to roll out an expanded launch in early 2008.

Tocarema has several Sun servers powered by the vendor’s multicore UltraSPARC T1 chips—which feature up to eight processing cores—that are running at its Russian development site, but the platform will be built using Sun’s Sun Fire X4150 servers, which are based on Intel’s multicore Xeon chips. 

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Sun Studio 12 software delivers auto-parallelizing C, C++, and Fortran compilers and tools for the Solaris and Linux platforms which simplify development on the newest multicore systems. Freely available, Sun Studio software is widely used, from creating commercial trading platforms on Wall Street to optimizing the latest innovative open source projects.

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