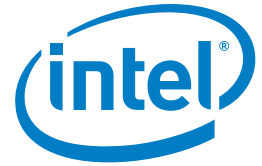


CASE STUDY

Intel® Xeon® Processor 5500 Series
Enterprise Server
Performance: Data Intensive Computing



Growth Leader Gains an Edge

Intel® Xeon® processor 5500 series' performance and reliability help Direct Edge challenge Wall Street's giants

Some companies might scale back their growth plans in the face of global recession and industry turbulence. Not electronic stock market Direct Edge. Focusing on customer-centered innovation, Direct Edge doubled its trading volume in the last year and vaulted a key competitor to become the third-largest market center for the trading of U.S. cash equities, trailing only the New York Stock Exchange and Nasdaq¹. Now, Direct Edge has set its sights higher. Pending approval by the U.S. Securities and Exchange Commission, it will open Wall Street's newest stock exchange in the spring of 2010. And the Intel® Xeon® processor 5500 series will serve as its technology engine.



CHALLENGES

- **Extreme performance.** Shaving a few microseconds off execution speeds can mean the difference between business success and also-ran status.
- **No fail.** Infrastructure failure can produce an immediate loss of business.
- **Massive scale.** Between soaring company growth and swings in trading volumes, Direct Edge's infrastructure must be ready for anything. The demands are rising as the company anticipates its evolution from electronic communications network (ECN) to full stock exchange.

SOLUTIONS

- **Drive growth with the Intel Xeon processor 5500 series.** Calling it the clear leader, Direct Edge has made the Intel Xeon processor 5500 series the cornerstone of its forthcoming trading platform and disaster recovery expansion.

IMPACT

- **2.5x speedup.** Direct Edge says its new HP ProLiant* G6 servers, powered by the Intel Xeon processor 5500 series, deliver 2.5x more performance than its current servers with dual-core, quad-socket technology. The increased performance will help accelerate trading and accommodate company growth and market surges.
- **5x greater density.** The solution packs five times more capacity into an equivalent space, saving an estimated USD 1.2 million annually by avoiding floor space expansion in its top-tier data center.
- **100 percent redundancy.** The solution's high performance and density are helping Direct Edge expand its backup data center to provide complete redundancy, doubling the cost savings and increasing service availability.



"We looked at the alternatives, but for dual-socket servers, the Intel® Xeon® processor 5500 series is absolutely the leader."

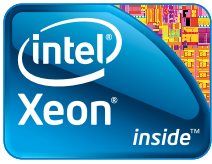
— John Ryan
Chief Architect
Direct Edge

Performance Leader

Few industries place greater demands on their IT infrastructures than the competitive world of high-velocity trading. Robust technology is a critical enabler for entering the industry, and platforms that allow a firm to execute billions of trades per day—and do it more quickly, reliably,

and economically than its competitors—can help it generate growth and gain a competitive advantage.

In 2009, Direct Edge became the fastest-growing U.S. equities marketplace². So the company's choice of the Intel Xeon processor 5500 series to power



Direct Edge aims to run Wall Street's next securities exchange on the Intel® Xeon® processor.

its next-generation trading platform speaks volumes about the processor's performance, reliability, scalability, and value. "We looked at the alternatives, but for dual-socket servers, the Intel Xeon processor 5500 series is absolutely the leader," says John Ryan, chief architect for Direct Edge.

Technology Arms Race

The Intel Xeon processor's performance will help Direct Edge execute billions of trades daily, and keep pace with both market trading peaks and its own explosive growth. Not only is Direct Edge handling twice as many trades as it did a year ago, but the market's increased velocity and volatility have produced nearly a tenfold jump in the number of associated messages the trading engine must match and process. Demands are ramping up as the company's growth plans unfold, including its expectation of migrating its popular EDGA* and EDGX* trading platforms to national securities exchanges in 2010.

"We're in a technology arms race," says Rafi Reguer, head of marketing and corporate communications at Direct Edge. "We've made significant investments in our infrastructure to get where we are. Now, as we prepare to launch two exchanges in two new data centers, we'll be doing the equivalent of changing all four tires while going 50 miles an hour down the highway. And we can't afford any downtime. In our industry, report card data is instantly available. If our infrastructure goes down,

everyone on Wall Street is instantly notified and customers can shift their business immediately and automatically."

Trading Up

Direct Edge selected the Intel Xeon processor 5500 series after pitting it head-to-head against alternative processors in tests that Ryan says "were all about speed and scalability." It was the top performer then, and the new HP ProLiant G6* servers—with the dual-socket, quad-core Intel Xeon processors—are giving the company approximately 2.5x more performance than the HP ProLiant 585 servers they replace, which had dual-core, quad-socket technology. According to Ryan, "Our applications benefit from Intel® Turbo Boost technology, reducing average latency though the processor's overclocking." The solution also features Intel® Network Interface Cards with support for Intel® I/O Acceleration technology for higher throughput.

The company will use approximately 200 ProLiant G6 servers for its anticipated exchange launch, and add another 200 as it builds out its backup data center to deliver 100 percent redundancy. Floor space in the state-of-the-art center is at a premium, and the fivefold density increase provided by the Intel Xeon processor-based ProLiant systems has a significant financial impact. "With five times more capacity than the existing system, the new solution gives us a very big increase in floor space capacity,"

SPOTLIGHT ON DIRECT EDGE

Direct Edge ECN LLC is the third-largest U.S. equities marketplace, with cash equities volumes that routinely exceed 1 billion shares daily. Located in Jersey City, NJ, Direct Edge uses multiple electronic communications networks and exchange platforms and unique order types to give investors flexible choices while maintaining the speed and quality of execution.

explains Reguer. "That's a big dollar saver, especially when you factor in the backup data center. Anything that lets us reduce footprint while maintaining industry-leading performance is very beneficial."

Ryan's team is also testing Intel's next-generation Intel Xeon processor, code-named Nehalem-EX, for its four-socket and eight-socket databases and applications.

Direct Edge has made its name—and shaken up Wall Street—by giving investors greater choice and lower trading prices. With its anticipated exchange status and its Intel Xeon processor-based technology as a foundation, Direct Edge is positioning itself to expand internationally and offer a broader range of products—and to continue its strategy of technology-enabled growth and innovation.

Performance: Data Intensive Computing. Support the most demanding business data processing and computationally intense graphics.

Find a solution that is right for your organization. Contact your Intel representative or visit the Reference Room at www.intel.com/references.



¹ Reuters, <http://www.reuters.com/article/pressRelease/idUS234299+02-Mar-2009+GNW20090302>.

² Company news release, June 24, 2009.

This document and the information given are for the convenience of Intel's customer base and are provided "AS IS" WITH NO WARRANTIES WHATSOEVER, EXPRESS OR IMPLIED, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, AND NON-INFRINGEMENT OF INTELLECTUAL PROPERTY RIGHTS. Receipt or possession of this document does not grant any license to any of the intellectual property described, displayed, or contained herein. Intel products are not intended for use in medical, life-saving, life-sustaining, critical control, or safety systems, or in nuclear facility applications.

Performance tests and ratings are measured using specific computer systems and/or components and reflect the approximate performance of Intel products as measured by those tests. Any difference in system hardware or software design or configuration may affect actual performance. Intel may make changes to specifications, product descriptions and plans at any time, without notice.

© 2010, Intel Corporation. All rights reserved. Intel, the Intel logo, and Intel Xeon are trademarks of Intel Corporation in the U.S. and other countries.

* Other names and brands may be claimed as the property of others.