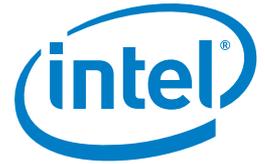


CASE STUDY

Intel® Xeon® processor 5600 series

Enterprise Server

Performance for Data-Intensive Computing



Opening the gateway to the markets

Intel® processors and server adapters helped Lek Securities reduce stock quote and order latency and increase data center density by 50 percent to handle growing demands for market data



“We saw dramatic improvements in performance with the Intel® Xeon® processor 5600 series compared with previous-generation processors....We can provide our customers with more market information, faster than ever before.”

*– Gary Cuzio,
Network Manager,
Lek Securities*

In financial markets, traders that can acquire more information faster than their competitors are at a distinct advantage. Lek Securities needed ways to ensure rapid and consistent delivery of market data to its trader customers, especially during periods of heavy market activity. The company selected the Intel® Ethernet Server Adapter I340 to help eliminate network bottlenecks and accommodate rising data volumes. The company also refreshed its quote and order gateway infrastructure with new servers based on the Intel® Xeon® processor 5600 series to improve application performance for customers while maximizing data center density. The company now runs 50 percent more applications than before in the same infrastructure footprint.

CHALLENGES

- **Accelerate performance, eliminate bottlenecks.** Help ensure rapid, consistent delivery of market data, avoiding gaps that can leave traders with “stale” information.
- **Accommodate peak loads.** Provide the processor and network capacity to sustain performance even during heavy trading activity, microbursts, and failover situations.
- **Control power and real estate.** Support rising demand for information by running more quote and order gateway applications while controlling IT costs.

SOLUTION

- **Intel® Xeon® processors and server adapters.** Lek Securities refreshed its quote and order gateway infrastructure with Dell PowerEdge* servers based on the Intel Xeon processor 5600 series and equipped with the Intel® Ethernet Server Adapter I340.

IMPACT

- **Faster performance, lower latency.** Intel processors help accelerate performance by 210 percent while Intel server adapters help increase throughput by 50 percent and reduce latency by 75 percent, allowing Lek Securities to deliver up-to-date market data even faster.
- **Handled peak loads.** Lek Securities now has the processing and network capacity to accommodate temporary spikes in customer demand or the increased traffic resulting from failover situations.
- **Delivered more information from the same footprint.** The company runs 50 percent more applications on the same number of servers as before.

Lek Securities provides traders with the latest market data from all the major exchanges, so traders can act on new opportunities within microseconds. High-performance computing (HPC) provides the processing and network performance required for delivering that data. “Our mission is to provide the very best execution and clearing services for our customers,” says Gary Cuzio, network manager at Lek Securities. “We need a robust server and network HPC infrastructure to receive

market data, process it, and deliver the data to our customers rapidly.”

In 2007, the IT group discovered some potential problems with its infrastructure that required immediate attention. “When the market was very busy, we noticed evidence of gaps in some market data feeds,” says Cuzio. “For traders, gaps can cause serious problems—traders might miss opportunities or try to act on stale data. After extensive testing, we determined that the bottleneck



Delivering the latest market data with Intel® Xeon® processors and Intel® server adapters

resulted from the server adapters. It was clear that we needed to replace the adapters that came standard on the servers with more high-performance technology.”

Efforts to avoid network issues coincided with the ongoing work to increase processing performance. “We need the performance and bandwidth to handle a continuously growing volume of market data without expanding our data center footprint,” says Pete Solano, systems administrator at Lek Securities.

Improving network performance with Intel® server adapters

To eliminate network bottlenecks, the Lek Securities team replaced existing network cards with Intel server adapters. “With the Intel server adapters, we were able to increase network performance and eliminate the gaps we had experienced in market feeds,” says Ciuzio.

After initially selecting the Intel® PRO/1000 PT Dual-Port Server Adapter in late 2007, the company subsequently migrated to the Intel® Ethernet Server Adapter I340 to enhance performance. The I340 adapter is a quad-port, PCIe Gen2* Gigabit Ethernet controller. “By moving to the Intel Ethernet Server Adapter I340, we have substantially reduced latency in delivering market data to customers, providing them the trading edge that they demand,” says Ciuzio.

The Lek Securities team optimized the operation of adapters to further increase performance. “The Intel engineers recommended disabling interrupt moderation,” says Solano. “In some cases, we increased throughput by 50 percent and reduced latency by approximately 75 percent while sending messages at sustained rates. We are also able to send 180 percent more messages per second than before. The gain in throughput and

reduction of latency allow our customers to run more sophisticated algorithms, which results in better trading decisions and gives them a competitive edge.”

Accelerating application performance by 210 percent with Intel® processors

To increase application performance, the Lek Securities team refreshed all of its stock quote and order gateway servers in the New York and Chicago data centers, which represent nearly 50 percent of the total server infrastructure in those centers. The team selected Dell PowerEdge* R610 servers equipped with the Intel® Xeon® processor 5600 series. “The new Intel processors have several capabilities that help drive better performance. For example, the larger 12 MB Intel® Smart Cache enables more on-chip processing to improve responsiveness,” says Solano. “We also take advantage of Intel® Turbo Boost Technology, which automatically increases the clock frequency on each chip when an application needs it.”

The Lek Securities team reached its processor decision after extensive in-house testing. “We saw dramatic improvements in performance with the Intel Xeon processor 5600 series compared with previous-generation processors,” says Ciuzio. “Many of our applications run up to 210 percent faster. As a result, we can provide our customers with more market information, faster than ever before.”

Running 50 percent more applications without increasing the IT footprint

The density of the new processors has helped the Lek Securities team expand capacity without buying and operating more servers. “The core counts available with the latest generation of Intel processors enable us to run up to 50 percent more applications—processing up to 50 percent more data—without adding racks,” says

SPOTLIGHT ON LEK SECURITIES CORPORATION

Lek Securities Corporation is an electronic order-execution and clearing firm that provides direct and rapid access to equities, options, and futures markets through its ROX* electronic order system. The company is dedicated to providing the very best execution and clearing services for institutional trading desks, market makers, exchange specialists, money managers, hedge funds, and other professional traders.

Ciuzio. “We can accommodate the rising demand for information without significantly increasing our ongoing costs.”

The cost savings are considerable. “In each data center, we avoided spending more than USD 140,000 on capital and operating expenses,” says Ciuzio. “Those savings allow us to invest in more innovative projects and help the company stay competitive.”

Accommodating peaks and sustaining uptime

With greater processing and network capacity available, the company now can better sustain application performance during periods of heavy user activity and crisis situations. “If one data center goes down, we failover to a second facility,” says Ciuzio. “By deploying new servers with the latest Intel processors and Intel server adapters, we have the capacity at each location to handle those temporary spikes in processing requirements. We can keep the business—and our customers—up and running.”

Building on the Intel foundation

The Lek Securities team now plans to further expand its international data centers. “Demand for information is constantly growing,” says Ciuzio. “Our customers rely on us to rapidly deliver tremendous volumes of information, and we know we can meet their needs with Intel technology.”

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