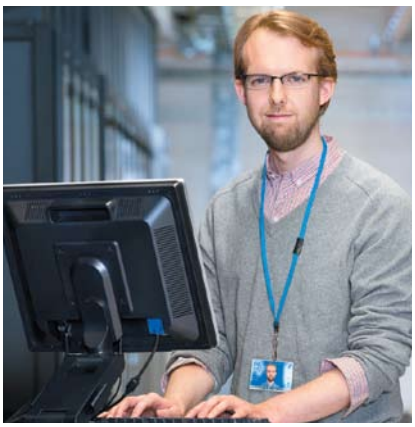
CASE STUDY
Intel® Xeon® processor 5500 series
High-Performance Computing
Performance: Data Intensive Computing

Making Supercomputers Super-Fast

Scalable Informatics uses Intel® technology to accelerate its customers' high-performance computing clusters and storage systems

When owners of high-performance computing (HPC) and storage clusters aren't getting the performance they need, they come to Scalable Informatics for help. The rapidly growing company specializes in helping its customers achieve exceptional results with computationally demanding and I/O-intensive workloads. To help customers break through HPC performance barriers, Scalable Informatics relies on Intel® technology.



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– Dr. Joseph Landman
Founder and CEO
Scalable Informatics

CHALLENGES

- **Speed up customers' research and analysis.** Provide increased performance for supercomputers and storage used in business and academia.
- **Boost energy efficiency.** Increase processing and storage capacity while reducing energy use.
- **Put more power in the platform.** Standardize on a powerful, scalable processor for the JackRabbit* and associated siCluster* platforms produced by Scalable Informatics.

SOLUTION

- Intel® Xeon® processor 5500 series

IMPACT

- **Accelerated performance.** The Intel Xeon processor 5500 series boosts performance by an estimated 400 to 500 percent for customers using the Scalable Informatics platforms as compared to previous-generation systems.
- **Reduced energy use.** Servers and storage platforms with the Intel Xeon processor 5500 series enable HPC infrastructure consolidation, reducing energy and support costs.
- **Increased competitiveness.** With the Intel Xeon processor 5500 series, the JackRabbit storage platform is even more competitive compared to mass-produced systems.

Eliminating Constraints to HPC Performance

Scalable Informatics builds storage clusters that deliver scalable bandwidth to eliminate the I/O constraints that can limit HPC performance. The company also designs and builds custom Linux* clusters for partners and customers. "Our storage systems tend to have more computational and I/O firepower than more traditional storage systems," says Dr. Joseph Landman, Scalable Informatics' founder and CEO. "In turn, this enables the vendors we partner with to deliver faster, more capable computing systems. We design and build balanced systems for our customers and partners."

Working with customers in a variety of fields, Landman found that many HPC challenges were storage-related. For example, server processors and chipsets available on the market offered only a limited number of PCI Express* (PCIe*) pathways. "That's an issue for companies such as financial services firms where data access or data motion is as much a rate-limiting factor as computation," says Landman. "Reducing these delays by increasing the bandwidth between CPU and memory, and between memory and the I/O channel, is essential for delivering meaningful solutions."

Powering Today's Demanding Research and Data Analysis

Meeting Stringent HPC Storage Requirements

Most of the available systems also couldn't scale to meet changing storage requirements in demanding fields such as academic research. "Clusters in academic settings typically run many different research jobs per day, each with a new set of data—and some of the data sets are extremely large," explains Landman. "The system has to be scalable enough to meet whatever demands are made on it."

When he learned of the Intel® Xeon® processor 5500 series, Landman immediately saw its potential to help solve customer problems. "Keeping processors fed with data for computations is essential for highly efficient processing," says Landman. "The Intel Xeon processor 5500 series is a big step forward, not only in CPU performance, but also in memory performance and I/O scalability. It's designed to support high-bandwidth I/O and the ability to scale across multiple connections as storage demand increases."

Boosting Performance by an Estimated 400 to 500 Percent

Scalable Informatics has now standardized on the Intel Xeon processor 5500 series for its JackRabbit and siCluster HPC storage platforms and is achieving new levels of success. "One of our customers estimates they have achieved four to five times better performance on our platform with the Intel Xeon processor 5500 series compared to their old system with previous-generation processors," says Landman. "The much-faster memory architecture and second-generation PCIe technology in the Intel processor have allowed us to increase our I/O bandwidth and take advantage of multiple high-speed 10-Gigabit Ethernet and Infiniband links to and from our platform."

Maximizing Storage Bandwidth Density

With the added processing and I/O power of the Intel Xeon processor 5500 series, the JackRabbit platform can also support significantly more storage bandwidth capacity in the same amount of space. "We can place three quarters of a petabyte of storage in a data center rack, with a bandwidth of 24 Gbps sustained aggregate read, and about 19 Gbps sustained write, backed by RAID-6*, QDR Infiniband, and other high-end technologies," says Landman. "This represents a storage bandwidth density of up to 585 Mbps per rack unit, using parallel file systems such as GlusterFS*, Lustre*, and eventually pNFS and Ceph*, and this aggregate bandwidth is available to cluster applications. Without the balanced system architecture enabled by Intel Xeon processor 5500 series–based systems, this performance density would be difficult to achieve."

Reducing Energy Use and Operating Costs

Many of the company's customers are able to replace multiple existing systems with just one of the new JackRabbit storage units. Scalable Informatics servers with the Intel Xeon processor 5500 series can also replace multiple older, less powerful servers. "Each older server that can be replaced with a service on our JackRabbit unit or a virtual machine running on a portion of the JackRabbit unit reduces energy consumption and corresponding cooling requirements," says Landman. "Customers can do more and spend less with more powerful and capable systems."

Increasing Competitiveness for Scalable Informatics

Using the Intel Xeon processor 5500 series in its products enables Scalable Informatics to compete even more effectively with larger companies. "The Intel Xeon processor 5500 series allows us to provide very tight coupling between processing power and I/O performance," says Landman. "The Intel technology gives us a significant advantage because we can better meet customer needs—for example, by helping customers in the financial sector analyze large historical data sets faster and arrive at answers sooner. Ultimately, that improves their bottom lines."

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

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

SPOTLIGHT ON SCALABLE INFORMATICS

Founded in 2002, Scalable Informatics is a privately owned, rapidly growing company serving HPC customers in financial services, engineering, business, and scientific computing. The founder of Scalable Informatics, Dr. Joseph Landman, has been working with HPC systems since 1988.