Case Study

Ace Computers

Intel® Quad-Core Technology

Ace Computers aids Lehigh University with a cluster utilized for global climate research.

Meet Ace Computers

Ace Computers, an Intel® Premier Partner, is a customer-centric systems integrator providing custom, high-performance computing, server, storage, and digital media solutions. It leverages long-standing close vendor relationships and a streamlined, just-in-time business model to offer the best possible price-performance to commercial enterprises, federal agencies, advanced digital media environments, and higher education institutions like Lehigh University.

Solution Overview

The solution involved a single rack cluster comprised of a headnode with two Intel® Xeon® processor 5440 with Intel® quad-core technology and 50Tb of DAS. The computing nodes were comprised of Intel® Server Systems SR1560SF. Each node contained two Intel Xeon processor 5440, along with 15k RPM SAS drives and Infiniband* adapters. The operating system is Clustercorp's Rocks+Rolls* with Intel® Compilers and the CONDOR* job control system.

"Ace offered an inexpensive means of providing a supercomputer-like solution. The parallel processing capability gave us the same bang for the buck."

—Benjamin Felzer, Assistant Professor, PHD, Earth and Environmental Sciences, Lehigh University

A conversation with Ace Computers, an Intel Premier Partner

What were the primary business or technology challenges facing your customer?

To study global climate change and biogeochemical and hydrological cycling in terrestrial ecosystems, Lehigh University's faculty and researchers needed supercomputer capabilities. However, they couldn't afford to spend hundreds of thousands of dollars on an actual supercomputer.

Describe the solution you developed to address these challenges.

Using Intel Server System SR1560SF with Infiniband, SAS controllers, and Intel Xeon processor 5440 allowed Ace Computers to maximize nodes per core at 2.5 GHz. This provided the necessary transfer rates to compute data at supercomputing speeds.

What technologies did you use?

- Intel Xeon processor 5400 series (quad-core)
- Intel Server Systems SR1560SF
- Infiniband
- SAS

Describe any implementation challenges.

Multiple parties were involved with creating the cluster, so it was difficult to bring everyone together to preload the cluster before shipping.

How did you overcome these implementation challenges?

The team never gave up in the face of a challenge. Also, since the solution was so simple to implement, the cluster was easily deployed onsite. Loading it was done in a matter of hours (instead of days), and all of the professors' requirements were met.

What are the benefits of the solution you provided for your customer?

The research scope was able to expand by maximizing the number of nodes per core. Infiniband architecture also delivered the swift connection speeds required for data transfer rates.

Describe how the solution you provided supports productivity and provides other measurable gains.

With this solution, Lehigh University is able to explore the effect of both historical changes and future scenarios of climate, CO2 fertilization and plant physiology, ozone pollution, and land use and management on ecosystem productivity and the hydrological response, using high-performance computing (HPC) modeling with climate and biogeochemical models. Since the solution allows for research into multiple facets of earth and environmental sciences, it's possible for researchers to provide the integrated knowledge necessary to understand the earth as a system.

To find out more about Ace Computers' technology solutions, visit www.acecomputers.com or call 877-Ace-Comp.

ACE
TECHNOLOGY WITH A VISION

Featured Technology:
Intel Xeon processor 5400 series (with Intel quad-core technology)

Intel Xeon processor 5400 series with Intel quad-core technology, along with Intel server systems that support this technology, deliver outstanding performance and breakthrough energy efficiency. This technology was designed from the ground up to provide the ultimate multitasking experience, and it includes four complete execution cores within a single processor. These qualities make it an ideal choice for high-performance computing (HPC).

Intel Xeon Processor 5400 Series: These processors offer second-generation quad-core technology with up to 3.16 GHz and large 12 MB L2 cache. These features boost software and socket compatibility, while increasing performance by up to 25 percent (compared to existing platforms using the same technologies). They also deliver a 38 percent improvement in performance per watt over the previous quad-core generation.

Intel Server Systems SR1560SF: They not only support quad-core processors, but also represent Intel's latest generation of rack-optimized server solutions. These systems deliver a large memory footprint, fast system bus, and high I/O bandwidth-critical features for HPC applications. Included are 1U fixed drive system supports and two 3.5" SATA drives in quick-release drive carriers.

For more information about Intel Xeon processor-based servers, visit www.intel.com.

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