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Louisiana State University: Faster Science, Greener System

(Source: Intel)

Intel® Xeon® processor E5 family gives Louisiana State University 14 times more performance in a greener cluster

Organization

Louisiana State University (LSU) is the state's flagship university, chartered to educate students, support leading-edge research, and promote economic growth. The High-Performance Computing at LSU (HPC@LSU) program provides advanced technologies and expertise that foster education, research, and discovery across all disciplines at the 30,000-student institution.

Challenge

HPC@LSU needed more capacity and performance to support increasingly sophisticated algorithms, larger data sets, and greater user demand. HPC@LSU wanted energy-efficient technologies that would help reduce the data center's carbon footprint and save on total cost of ownership.

Solution

HPC@LSU is deploying a next-generation cluster of 440 Dell PowerEdge* C6220 servers, each powered by two 8-core Intel® Xeon® processors E5-2600 product family running at 2.6 GHz for a total of 7,040 computational cores. The nodes are interconnected by a 40 Gbps Mellanox InfiniBand* network. While most nodes (382) have 32 GB of memory, eight are equipped with 256 GB each and joined via ScaleMP* software to yield a single symmetric multiprocessing (SMP) machine with 128 processing cores and 2 TB of memory. Fifty nodes are each equipped with 64 GB of memory and two NVIDIA Tesla* M2090 graphics processing units (GPUs). The cluster provides peak performance of 212 TF and runs Red Hat Enterprise Linux* (RHEL*) 6. Designed to meet the demanding density, scale, and throughput requirements of cloud and HPC data centers, the energy- efficient cluster gives LSU 14 times more performance than its previous cluster, Tezpur.

Benefits

"This cluster gives us the power to do more," says Joel Tohline, director of LSU's Center for Computation and Technology and a professor of physics and astronomy. "We'll see more exciting science and engineering research. We'll see students of all ages being excited about high-performance computing. We also expect to boost the state's economic activities by sharing approximately 10 percent of our computing cycles with Louisiana's growing film and visual-effects industries."

Dr. Tohline says capabilities such as Intel® Advanced Vector Extension (Intel® AVX) and Intel® Turbo Boost Technology1 2.0 will provide significant additional speed for critical workloads over and above the base 14-fold improvement. He's also looking forward to the Intel® Xeon PhiTM coprocessor, based on Intel® Many Integrated Cores (Intel® MIC) architecture.

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