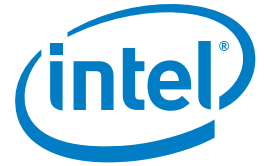


SUCCESS BRIEF

Intel® Xeon® processor E5 family
Education
Technical Computing in the Cloud
High-Performance Computing



Speeding Storm-Surge Analysis

At RENCI, the Intel® Xeon® processor E5 family doubles the wall-time performance of workhorse ADCIRC code



"Bringing in the new
processor family is high
on our priority list.
We're very impressed."

– Robert J. Fowler,
Director of High Performance Computing,
RENCI

INSTITUTION

Renaissance Computing Institute (RENCI) is a multidisciplinary, high-performance computing (HPC) research collaboration among Duke University, North Carolina State University, the University of North Carolina at Chapel Hill, and the state of North Carolina.

CHALLENGE

RENCI operates high-performance research clusters based on the Intel® Xeon® processor 5600 series. RENCI is eager for more performance, memory capacity, and throughput.

SOLUTION

RENCI explored the performance advantages of the Intel® Xeon® processor E5 family, which provides Intel® Integrated I/O, support for the PCI Express* (PCIe) 3.0 specification, increased memory capacity, and Intel® Advanced Vector Extensions (Intel® AVX), which support higher floating-point performance than the previous generation. RENCI tested ADCIRC, a widely used storm-surge and tide model that its scientists run every day to study and to help agencies plan for and respond to hurricane storm surges.

BENEFITS

RENCI compared an ADCIRC benchmark example running on a single node of its Intel Xeon processor 5650 2.66 GHz-based cluster and a single node of a system with an Intel Xeon processor E5-2680 2.7 GHz. Moving from six cores on the older processor to the newer, eight-core processor, wall-clock execution time dropped from 5 hours, 59 minutes, 28 seconds to 3 hours, 5 minutes, 8 seconds.

"The results are quite impressive, especially considering that we weren't running with any special compilation flags for the new processors," says Brad Viviano, infrastructure manager at RENCI. "Wall time is what really counts for us, since it affects how quickly we can push jobs through the system. This is close to a factor of two improvement."

The enhanced memory capacity and I/O of the Intel Xeon processor E5 family will be valuable at RENCI, where a single bioinformatics application will produce a petabyte of data within a year. The family's feature set can help RENCI scientists increase productivity, examine problems in greater detail, obtain results more quickly, and advance their science while helping ensure flexibility in the data center as RENCI researches the development of private clouds.

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Intel® Advanced Vector Extension (Intel® AVX) is a new 256-bit instruction set extension to SSE and is designed for applications that are floating-point intensive. To learn more about Intel® AVX, visit <http://software.intel.com/en-us/avx/>.

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