

NCSA installs SGI Altix SMP system

Cobalt posts impressive STREAM, WRF performance

CHAMPAIGN, IL — The National Center for Supercomputing Applications has added 6.5 teraflops of computing power to its machine room with the installation of a Silicon Graphics shared-memory, symmetric multi-processor (SMP) computing system, visualization capability, and storage technology. The SGI® Altix® system, called Cobalt, is the largest shared memory machine in the National Science Foundation system and the largest SMP system to be part of the TeraGrid network.

Shared memory machines are advantageous for many scientific and engineering applications, including adaptive mesh refinement simulations in atmospheric science, astronomy, and other fields; interactive and non-sequential parallel analysis and mining of very large datasets; and high-end visualization services.

"Cobalt offers researchers a unique configuration that is not available elsewhere in the national cyberinfrastructure," says NCSA director Thom Dunning. "This system can work with very large computational applications, create and retain large datasets and databases in memory, and enable real-time, interactive data analysis."

Cobalt consists of 1,024 Intel® Itanium® 2 processors running the Linux® operating system, 3 terabytes of globally accessible memory, 8 SGI Prism systems, and 370 terabytes of SGI® InfiniteStorage that serve as a shared file system, accessible by the other high-performance computing resources at NCSA.

The Altix system has already clocked the best ever performance running the STREAM benchmark, which measures memory bandwidth (MBytes/sec) to processor. Memory bandwidth is a critical issue in computer design, because the rate at which data is available for processing is always slower than the time it takes to process the data. High memory bandwidth is vital in realizing a balanced computing system. The performance achieved on Cobalt bested the previous top performance by 11 percent and currently tops the STREAM rankings posted at <http://www.cs.virginia.edu/stream/>.

Cobalt has also achieved an impressive sustained performance of 150 gigaflops per second running the Weather Research and Forecast System, WRF V2, standard benchmark on 256 processors. This is 37 percent better than the best current 256-processor result posted by the National Center for Atmospheric Research at <http://box.mmm.ucar.edu/wrf/bench/>. WRF, including its adaptive mesh refinement features, is beginning to be used on Cobalt to carry out very large simulations of severe storms and will be used this spring for storm forecasting.

Cobalt will be fully available to scientific users in March. With its addition to NCSA's machine room, the center now offers more than 43 teraflops of computing power integrated with 1 petabyte of disk storage to the nation's scientific researchers and its private sector partners.

About NCSA

NCSA (National Center for Supercomputing Applications) is a national high-performance computing center that develops and deploys cutting-edge computing, networking and information technologies. Located at the University of Illinois at Urbana-Champaign, NCSA is funded by the National Science Foundation. Additional support comes from the state of Illinois, the University of Illinois, private sector partners and other federal agencies. For more information, see <http://www.ncsa.uiuc.edu/>.