

## **National Center for Computational Sciences Snapshot November 20 2006**

### **The Cray XT4 Arrives at the NCCS**

The first 36 of 68 new cabinets have arrived at the second floor of Oak Ridge National Laboratory's (ORNL's) Computational Sciences Building. This delivery will allow the National Center for Computational Sciences (NCCS) to eventually upgrade the Jaguar system fivefold, to 250 trillion calculations per second (teraflops).

Once the remaining 32 cabinets arrive on November 21 and 22, the new Cray XT4 system will be stabilized and undergo acceptance testing. Jaguar users will then be transitioned to the new system while the existing Cray XT3 is moved to the second floor.

The two systems will be combined in early 2007, resulting in a supercomputer capable of more than 100 teraflops. Upgrades later in the year will allow the combined system to reach a peak performance of 250 teraflops.

In preparation for combining the two systems, the Cray XT3 was upgraded to UNICOS/lc 1.5.25 on November 8. The operating system upgrade will enable the Cray XT3 and XT4 to ultimately operate as one system.

### **ORNL Unveils New Booth at SC06**

The NCCS was once again a major player at the country's premier supercomputing conference, touting the scientific breakthroughs being made on the center's state-of-the-art platforms and previewing the path to petascale science.

SC06, the international conference for high-performance computing, networking, storage, and analysis, was held November 11–17 in Tampa, Florida. The NCCS unveiled a new booth for the conference that featured all-electronic content focused on advanced networking, leadership computing and applications, and the many scientific applications that are enabled through high-performance computing at the center. Interactive kiosks and a large power wall visitors to learn more about current activities in areas supernova evolution, fusion plasma simulation, and atmospheric carbon dioxide patterning.

The NCCS also displayed a cabinet from the new Cray XT4 now being installed at the center, and a live video feed from Oak Ridge gave attendees a firsthand look at the upgrade.

NCCS presentations throughout the conference focused on the work of leading computational scientists and researchers from around the country, representing academia, national laboratories, and industry. Featured presenters included William Tang of the Princeton Plasma Physics Laboratory; Jeff Candy of General Atomics; Steve Scott and John Levesque of Cray, Inc.; and Chris Johnson of the University of Utah. Content from the booth can be seen at <http://www.csm.ornl.gov/SC2006/SC06index.html>.

### **Jaguar Makes the Top 10**

The NCCS's Jaguar system is now officially the tenth most powerful supercomputer in the world.

With a peak performance of 54 teraflops, the Cray XT3 system moved up from the thirteenth position on the TOP500 List of supercomputers, moving ahead of the JUBL system in Germany, the Earth Simulator in Japan, and the Stella system in the Netherlands.

The new rankings were released November 14 at the SC06 high-performance computing conference in Tampa, Florida. The TOP500 List is compiled every 6 months by Hans Meuer of the University of Mannheim in Germany, Erich Strohmaier and Horst Simon of the National Energy Research Scientific Computing Center and Lawrence Berkley National Laboratory, and Jack Dongarra of the University of Tennessee.

Jaguar's new position reflects improvements made to the system in July. At that time the system's single-core Opteron™ processors were replaced with dual-core processors, increasing the system's performance from 25 teraflops to more than 50 teraflops.

Improvements will continue in the coming months. The cabinets that arrived last week will be merged with the existing system in early 2007 to create a supercomputer capable of 100 teraflops. By the end of 2007, Jaguar's dual-core processors will be replaced with quad-core processors, making the system capable of 250 teraflops.

### **Lustre Center of Excellence Established at NCCS**

Cluster File Systems, Inc., (CFS) has established the first Lustre Center of Excellence at the NCCS.

The new center, part of the effort to bring a petascale supercomputer to ORNL by the end of 2008, is focused on three goals:

1. enhancing the scalability of the Lustre File System to meet the performance requirements of petascale systems,
2. building Lustre expertise through training and workshops, and
3. assisting science teams in getting the maximum I/O performance from their applications.

“The Lustre Center of Excellence will be a catalyst for scientific breakthroughs,” said Thomas Zacharia, Associate Laboratory Director for computing at ORNL. “Moreover, the Lustre Center of Excellence will become a focal point for universities, labs, and vendors to come together and use the flexibility and open-source status of Lustre to create solutions to their high-performance-file-system needs.”

“A growing number of supercomputing sites are turning to Lustre software to meet the requirements for high performance and scalability,” said Peter Braam, CFS president and chief executive officer. “We want to make sure that we will meet their demands well into the future.”