

ORNL Jaguar supercomputer surpasses 50 teraflops

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Oak Ridge National Laboratory has increased computing power of its Cray supercomputing system (shown here) to 54 teraflops, or 54 trillion mathematical calculations per second, placing it among the most powerful open scientific systems in the world.

An upgrade to the Cray XT3 supercomputer at Oak Ridge National Laboratory, the most powerful supercomputer available for general scientific research in the United States, has increased the system's computing power to 54 teraflops, or 54 trillion mathematical calculations per second.

The computer, dubbed Jaguar, is the largest in the Department of Energy's Office of Science and is the major computing resource for DOE's Innovative and Novel Computational Impact on Theory and Experiment, or INCITE, program. The system is available to all scientific researchers and research organizations, including industry,

through an annual call for proposals. Three of the four companies -- Boeing, DreamWorks Animation and General Atomics -- awarded INCITE grants for 2006 are doing their work at ORNL.

"With the expansion of the leadership computing resources at Oak Ridge, the Department of Energy is continuing to deliver state-of-the-art computational platforms for open, high-impact scientific research," said Michael Strayer, director of DOE's Office of Advanced Scientific Computing Research. "The expanded system will be instrumental in addressing some of the most challenging scientific problems in areas such as climate modeling, materials science, fusion energy and combustion."

The upgrade involved replacing all 5,212 processors with Cray's latest dual-core processors, doubling the memory and adding additional interconnect cables to double the bisection bandwidth. The Jaguar now features more than 10,400 processing cores and 21 terabytes of memory. The upgraded Cray XT3 has passed ORNL's acceptance tests.

"The XT3 is a remarkable system for scientific calculations, and the upgrade of all system components maintains the balance of the machine while doubling the performance," said ORNL's Thomas Zacharia, associate laboratory director.

ORNL's Buddy Bland, project director for the Leadership Computing Facility, noted that the upgrade went smoothly and on schedule, "continuing Cray's record of delivering major systems on time."

DOE's Leadership Computing Facility is on a path to exceed 100 teraflops by the end of this year and to reach a petaflop, or 1 quadrillion mathematical calculations per second, by 2009.

"This represents a key milestone in our adaptive supercomputing vision

as well as a demonstration of our partnership with Oak Ridge National Lab aimed at delivering a series of increasingly powerful productive supercomputers, including a system that crosses the petaflop barrier," said Peter Ungaro, Cray chief executive officer and president. "The powerful combination of Cray supercomputers and the technical expertise at ORNL is destined to result in significant breakthroughs in real-world scientific and engineering problems that will ultimately have a major impact on society."

Source: Oak Ridge National Laboratory

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