NSF Awards $150 Million To Operate, Enhance The TeraGrid

SDSC receives $14 million to provide TeraGrid resources, development and support

August 18, 2005

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The National Science Foundation has made a five-year, $150 million award to operate and enhance the Extensible Terascale Facility, also called TeraGrid. As one of the leading providers of TeraGrid resources, the San Diego Supercomputer Center, organized research unit of UCSD, will receive more than $14 million of this award over a five-year period.

TeraGrid - built over the past four years - is the world's largest, most comprehensive distributed cyberinfrastructure for open scientific research. Through high-performance network connections, TeraGrid integrates high-performance computers, data resources and tools, and high-end experimental facilities, making these resources accessible to researchers and educators across the country to accelerate advances in science and engineering.

"TeraGrid unites the science and engineering community so that larger, more complex scientific questions can be answered said NSF director, Arden Bement, Jr. "Solving these larger challenges, will, in turn motivate the development of the next generation of cyberinfrastructure. This is a win-win situation consistent with NSF's mission to keep science and engineering at the frontier."

SDSC's TeraGrid cluster currently consists of 256 IBM cluster nodes, each with dual 1.5 GHz Intel® Itanium® 2 processors, for a peak performance of 3.1 Teraflops, a total memory of 1 Terabyte, and a total of 40 Terabytes GPFS disk through the fiber optic SAN network. The nodes are equipped with four gigabytes (GBs) of physical memory per node. The cluster is running SuSE Linux and is using Myricom's Myrinet cluster interconnect network.

The new TeraGrid award includes $48 million to provide overall architecture, software integration, operations and coordination of user support. The University of Chicago will lead this effort.

An additional $100 million will provide for operation, management and user support of TeraGrid resources at eight resource provider (RP) sites. RP sites include Argonne National Laboratory/University of Chicago, Indiana University, National Center for Computing Applications (NCSA), Oak Ridge National Laboratory, Pittsburgh Supercomputing Center, Purdue University, Texas Advanced Computing Center and SDSC.

George Karniadakis, a professor of applied mathematics at Brown University, has long been a leader in applying NSF computing resources to a variety of fluid dynamics problems. Karniadakis now uses computational resources simultaneously at four different TeraGrid sites, including SDSC.

"The TeraGrid is a distributed supercomputer, a system with potentially unlimited capability for us," said Karniadakis. "For the first time, we can simulate cardiovascular processes in the entire arterial tree."

Thomas Jordan, director of the Southern California Earthquake Center at the University of Southern California, leads an effort to combine computational models from several disciplines to shed new light on the consequences

of earthquakes. Computed and then visualized with SDSC resources, this program also known as "TeraShake" was one of the largest and most detailed earthquake simulation ever conducted.

"TeraGrid is providing us with the computational resources to deploy an entirely new technology for seismic hazard analysis," said Jordan.

For more information about TeraGrid, please see www.teragrid.org.

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