SDSC Part of $15 Million Project to Create “FutureGrid” Computer Network

NSF-Funded Project to Test Novel Approaches to Parallel, Grid and Cloud Computing

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The San Diego Supercomputer Center (SDSC) at UC San Diego is part of a team chosen by the National Science Foundation (NSF) to build and run an experimental high-performance grid test-bed, allowing researchers to collaboratively develop and test new approaches to parallel, grid and cloud computing.

Called "FutureGrid," the four-year project, led by Indiana University (IU), was awarded a $10.1 million grant from the NSF to link nine computational resources at six partner sites across the country as well as allowing transatlantic collaboration via a partnership with Grid'5000, a large scale computer infrastructure primarily throughout France. The FutureGrid test-bed is expected to be installed and operational by next spring.

Partners with IU in the FutureGrid project include SDSC, Purdue University, University of Chicago/Argonne National Labs, University of Florida, University of Southern California Information Sciences Institute, University of Tennessee Knoxville, University of Texas at Austin/Texas Advanced Computing Center, University of Virginia, and the Center for Information Services and GWT-TUD from Technische Universtität in Dresden, Germany.

These project partners will provide additional funding for the FutureGrid project, bringing the program total to $15 million.

FutureGrid, to be composed of nearly 1,400 state-of-the-art CPUs (central processing units), will ultimately benefit projects that require enormous data processing capabilities, such as complex modeling of climate systems, or analyzing and comparing DNA sequences and complex organic molecules.

"We are pleased to be part of this outstanding team," said Shava Smallen, SDSC's principal investigator on the FutureGrid project. "Researchers will be able to test new approaches to data analysis and computation on a wide range of customizable FutureGrid environments made possible by leveraging cloud computing technologies."

SDSC researchers will participate in benchmarking, as well as deploy and enhance its "Inca" monitoring software to support FutureGrid requirements. Funded by the NSF under a separate program, Inca is designed to detect grid infrastructure problems by executing periodic user-level grid monitoring software and services. SDSC this summer released the latest version, Inca 2.5.

"FutureGrid will allow developers to test their software at an unprecedented scale, enabling bugs that currently go undetected in smaller test environments to be fixed before production," added Smallen, who is also the group lead on SDSC's Inca program. "This will improve stability of grid software in general, a challenge for many production grids today. As Inca developers, we also expect to benefit from using FutureGrid."

Compute and data resources will be connected together through advanced research and education networks such as the National Lambda Rail and Internet2, in addition to Purdue University through IU's I-Light and also to the High Performance Computing Center at the Technical University in Dresden.

"We envision the grids and clouds of the future not as a single system, but as many linked systems," said Geoffrey Fox, director of the Pervasive Technology Institute (PTI) Digital Science Center, a professor in the IU Bloomington School of Informatics and Computing, and project leader of the FutureGrid, in a statement issued earlier this month. "For this reason, we are engaging an incredible set of academic and commercial partners throughout the U.S. and in Europe to participate in FutureGrid."

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