

FutureGrid to provide platform for experimental computation

November 17 2009

(PhysOrg.com) -- Over the next few months, a consortium that includes the University of Chicago will establish FutureGrid, a collaborative next-generation system for experimental scientific supercomputing.

“FutureGrid is a very exciting project; we do have production resources as part of such projects as TeraGrid or Open Science Grid, but a resource that would allow scientists to experiment with new technologies or ideas at reasonable scale was missing,” said Kate Keahey, a research scientist at the Computation Institute of UChicago and Argonne National Laboratory.

Indiana University leads the \$15 million FutureGrid project, which largely is supported by the National Science Foundation. Indiana University, UChicago, the University of Florida and the Texas Advanced Computing Center at the University of Texas at Austin will serve as hardware centers for the project.

Additional FutureGrid partners are Purdue University, San Diego [Supercomputer](#) Center at the University of California San Diego, University of Southern California Information Sciences Institute, University of Tennessee Knoxville, University of Virginia and the Center for Information Services and GWT-TUD from Technische Universität in Dresden, Germany.

Researchers will be able to experiment with cloud-computing technologies on FutureGrid, which will complement TeraGrid, a national-

scale system of interconnected computers that scientists and engineers use to solve some of their most challenging problems. The term “cloud computing” lends itself to various definitions, but it generally refers to the methods used to seamlessly provide processing time on remote computers.

TeraGrid runs earthquake and climate simulations among a wide variety of other scientific research projects.

“Having an experimental testbed is an essential tool for Computer Science,” said Keahey, who leads the Computation Institute’s FutureGrid efforts. As a production grid, TeraGrid provides a specific set of computing services on a platform that users can rely on without encountering frequent configuration changes and service disruptions.

However, experimental computation may require weekly configuration changes. Part of that experimentation entails testing new systems that are potentially vulnerable, unstable or failure-prone. “All of those things are antithetical to a production infrastructure,” Keahey said.

FutureGrid users will be able to learn from the experiences of users of France’s Grid’5000, a highly reconfigurable experimental infrastructure for supporting computer science research. As FutureGrid’s liaison to Grid’5000, Keahey looks for ways to learn from and improve upon the experience of her French colleagues in developing such a system, as well as foster collaboration between the two projects.

Keahey’s team has developed the Nimbus toolkit, which provides open source software for configuring clouds and tools that allow scientists to harness the computational power of virtual machines. Their work has benefited collaborations at Brookhaven National Laboratory and CERN, the European Laboratory for Particle Physics, as well as applications in bioinformatics and medical sciences.

“Cloud computing is just one of the new technologies that we can experiment with on FutureGrid” Keahey said. “FutureGrid is going to provide a very important vehicle for innovation that was missing.”

Provided by University of Chicago ([news](#) : [web](#))

Citation: FutureGrid to provide platform for experimental computation (2009, November 17)
retrieved 26 April 2024 from
<https://phys.org/news/2009-11-futuregrid-platform-experimental.html>

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