

New computer software enables rapid response to time-critical emergencies

November 16 2006

The U.S. Department of Energy's Argonne National Laboratory and University of Chicago researchers demonstrated a new specialized software system at Supercomputing 2006 that provides computational resources quickly for emergency applications affecting public health, safety, and security. This new system, called SPRUCE (Special PRiority and Urgent Computing Environment), supports urgent computing on both traditional supercomputers and distributed computational Grids.

The SPRUCE system was demonstrated at the Argonne National Laboratory and TeraGrid booths at SC06, the world's premier supercomputing and networking conference. The demonstration featured a hypothetical situation in which scientists requested immediate access to the TeraGrid supercomputers at the University of Chicago to make time-sensitive analyses of a fast-evolving weather emergency.

"SPRUCE makes massive resources available on short notice for critical applications," said Pete Beckman, leader of the SPRUCE project and computer scientist at Argonne National Laboratory as well as a senior fellow at the University of Chicago Computation Institute.

The system provides users with "right-of-way" tokens applicable to a select set of computer resources and urgency levels. During an emergency, a token can be activated either automatically via Web services or manually from a Web-based portal.

Computer resources that are linked into the SPRUCE system can

respond to the emergency call, for example, by preempting other jobs or running them immediately after the current job completes.

"Severe weather prediction can be computationally intensive and naturally the workload is unpredictable; we need access to supercomputers quickly when severe storm forecasts are required," said Kelvin Droegemeier, head of the National Science Foundation LEAD project (Linked Environments for Atmospheric Discovery) and Associate Vice President for Research at the University of Oklahoma. "With SPRUCE, we can rapidly get resources at some of the nation's largest supercomputer centers."

"Integrating the weather forecast models available from the LEAD Web portal with SPRUCE demonstrates the flexibility of our advanced Web-based tools for collaboration and scientific computation," said Dennis Gannon, a computer science professor at Indiana University, who is co-director of the LEAD Web portal with Beth Plale, also a professor at Indiana.

"By providing fast, immediate access, SPRUCE can assist with urgent decisions required by flash floods or wildfires, where late results can be useless," Beckman said. "We envision in the future, that all of the nation's largest supercomputers will be ready to provide urgent computing to support and protect the nation."

Source: Argonne National Laboratory

Citation: New computer software enables rapid response to time-critical emergencies (2006, November 16) retrieved 26 April 2024 from <https://phys.org/news/2006-11-software-enables-rapid-response-time-critical.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.