

Grid Computing

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Abstract

In my talk, I will review the current status of some major Grid projects in the world, and describe in some detail the National Research Grid Initiative (NAREGI) project on Grid middleware research and development in Japan as an example, and its relation to the new national project on the next generation supercomputer development project.

The National Research Grid Initiative (NAREGI), which originally started as a five-year project in FY 2003, under the auspices of the Ministry of Education, Culture, Sports, Science and technology (MEXT), as one of the major Japanese national Grid projects. Collaboration among industry, academia, and the government will play a key role in NAREGI. The Center for Grid Research and Development has been established at the National Institute of Informatics as a core center for R&D on high-performance, scalable Grid middleware technologies, which are aimed at providing a future computational infrastructure and environment for scientific and engineering research. As an example of utilizing such Grid technologies in the scientific communities, The Computational Nanoscience Center, another core center of NAREGI, located at the Institute for Molecular Science in Okazaki,

is conducting research on leading-edge, grid-enabled nanoscience and nanotechnology simulation applications.

NAREGI released its beta version Grid middleware in May 2006. The NAREGI Grid middleware is expected to be utilized as one of the software layers in the nation-wide Cyber Science Infrastructure (CSI) framework, which has been newly initiated at the National Institute of Informatics.

In the meantime, MEXT initiated a new project in April 2006, to design and develop the next generation supercomputer system. This is a 7 year project, with an expected total budget of $\sim 1B$ \$. The objectives of this project are development, installation and usage of the multi-petaflops class supercomputing system as a national leadership machine to be utilized by academia, research communities and industries. This project includes such programs as research and development of the system software and the grand challenge applications, development of the hardware system, and establishment and operation of the Advanced Center for Computational Science and Technology based on the said system.

NAREGI will continue to conduct research and development on Grid middleware as a part of the system software development program. Within the new framework, NAREGI is directed toward providing the seamless computational environment to research and academic communities in the forthcoming "peta-scale" era.