

Cyber Science Infrastructure

<http://www.nii.ac.jp/>

The National Institute of Informatics (NII) is a Japan's sole academic research institute dedicated to the field of informatics. It offers a powerful information platform for research activities and collaboration. NII is promoting consolidation of **Cyber Science Infrastructure (CSI)**, an information platform utilizing various resources over a high-speed network. This exhibit presents the latest activities to build/utilize CSI for e-Science, including networking, ID management, grid and 3D internet.



Networking → <http://www.sinet.ad.jp/>

The Science Information Network (SINET) is an information communication network connecting universities and research institutions throughout Japan via nationwide nodes (connection points); it is designed to promote research and education as well as the circulation of scientific information among universities, research institutions, and similar entities. The Science Information Network is also connected to research networks such as Abilene in the U.S. and GEANT in Europe to facilitate the international dissemination of research information and to promote collaboration with research networks overseas. We explain the SINET3 architecture that has strongly supported Grid and cluster computing.



Federated Access Management → <https://upki-portal.nii.ac.jp/SSO/>

NII is currently promoting the federated identify management which enables a single sign-on to scholarly web resources such as electronic journals and research databases. The environment is based on SAML 2.0 standard and mainly utilizing Shibboleth middleware developed by Internet 2. Feasibility study of this project has been done in 2008. 30 identify providers and 18 service providers joined to the experiment. Not only executing the connection test each other but also fabric of the federation including basic policy, system architecture and specification were also discussed among participants. The federation is now moved to pilot operation. The presentation provides our current status and design of our federation.



Grid → <http://www.naregi.org/>

The grid is a technology enabling advanced services, e.g. computing, data sharing and collaborative experiments, by sharing/federating resources. We present our grid middleware projects, NAREGI and RENKEI, and show demonstrations. The NAREGI middleware ver.1.1 is currently available, and universities/institutes in Japan started pilot grid operation using the NAREGI middleware. NII also started a new R&D project, "RENKEI", to develop new middleware enabling more federation among small/mid scale computers in laboratories, supercomputers and international grids.



3D Internet for e-Science → <http://www.prendingerlab.net/globalab/>

The interactive demo will show examples of collaborative visualization and data exploration in the areas of molecular science and astrophysics, based on the 3D Internet. The 3D Internet is an infrastructure for real-time, live collaboration in distributed online 3D virtual worlds. The presented applications use OpenSimulator open source server software as the simulation environment. The demo will showcase the key role of NII's Cyber Science Infrastructure (CSI), in particular its grid and high-speed networking capabilities, for generating simulations in the field of molecular dynamics and for transferring large-scale data from the compute center to the visualization site. Our demo aims to implement the notion of "democratization of e-Science", where anyone can easily benefit from a HPC environment, from anywhere, anytime. The unique aspect of our framework is that it allows one to experience the results of supercomputing interactively and immersively in the virtual world.

