Geophysical Research Abstracts
Vol. 12, EGU2010-12306, 2010
EGU General Assembly 2010

e-Science on Earthquake Disaster Mitigation by EUAsiaGrid

Eric Yen (1), Simon Lin (2), Hsin-Yen Chen (1), Li Chao (3), Bor-Shoh Huang (3), and Wen-Tzong Liang (3)
(1) (eric@sinica.edu.tw, hychen@twgrid.org) Academia Sinica Grid Computing Centre, Taipei, Taiwan, (2) (Simon.Lin@twgrid.org) Institute of Physics, Academia Sinica, Taipei, Taiwan, (3) (zhaol@earth.sinica.edu.tw, hwbs@earth.sinica.edu.tw, wtl@earth.sinica.edu.tw) Institute of Earth Science, Academia Sinica, Taipei, Taiwan

Although earthquake is not predictable at this moment, with the aid of accurate seismic wave propagation analysis, we could simulate the potential hazards at all distances from possible fault sources by understanding the source rupture process during large earthquakes. With the integration of strong ground-motion sensor network, earthquake data center and seismic wave propagation analysis over gLite e-Science Infrastructure, we could explore much better knowledge on the impact and vulnerability of potential earthquake hazards. On the other hand, this application also demonstrated the e-Science way to investigate unknown earth structure.

Regional integration of earthquake sensor networks could aid in fast event reporting and accurate event data collection. Federation of earthquake data center entails consolidation and sharing of seismology and geology knowledge. Capability building of seismic wave propagation analysis implies the predictability of potential hazard impacts. With gLite infrastructure and EUAsiaGrid collaboration framework, earth scientists from Taiwan, Vietnam, Philippine, Thailand are working together to alleviate potential seismic threats by making use of Grid technologies and also to support seismology researches by e-Science. A cross continental e-infrastructure, based on EGEE and EUAsiaGrid, is established for seismic wave forward simulation and risk estimation. Both the computing challenge on seismic wave analysis among 5 European and Asian partners, and the data challenge for data center federation had been exercised and verified. Seismogram-on-Demand service is also developed for the automatic generation of seismogram on any sensor point to a specific epicenter.

To ease the access to all the services based on users workflow and retain the maximal flexibility, a Seismology Science Gateway integating data, computation, workflow, services and user communities would be implemented based on typical use cases. In the future, extension of the earthquake wave propagation to tsunami mitigation would be feasible once the user community support is in place.