International Co-operation on Grid Technologies
Target Country: China

Overview of Grid Activities in China

Jorge Gasós
European Commission
jorge.gasos@cec.eu.int
http://www.cordis.lu/ist/grids

Main Grid initiatives in China

Ministry of Science and Technology
- China National Grid (CNGrid); part of the National Hi-tech Program (863)

NSF of China
- CROWNE Grid

Application Grids
- ChinaGrid, supported by the Ministry of Education
- China Science Data Grid (SDG), supported by the Chinese Academy of Science
Overview of CNGrid

A key project supported by the National High-Tech R&D Program (the 863 program)

4-year project

- Launched in May 2002
- Earliest and largest Grid project in China
- ¥100 million government fund from the MOST of China
- Two to three times more associated funds from local governments, application organizations, and industry

Major tasks of the project

Developing a Grid test-bed

Developing a 4TFlops high performance computer for the grid

Developing a set of grid software to support grid applications and grid operation and management

Developing several application grids

- Productive systems
- Demonstration of the future grid applications
Grid test-bed and HPC development

Eight nodes across the country

- CAS Network Center (Beijing)
- Shanghai Supercomputer Center (Shanghai)
- Tsinghua University (Beijing)
- Institute of Applied Physics and Computational Mathematics (Beijing)
- University of Science and Technology of China (Hefei, Anhui)
- Xi’an Jiaotong University (Xi’an, Shaanxi)
- NUDT (Changsha)
- Hong Kong University (Hong Kong)

Two >4TFlops machines: Dawning 4000 and Lenovo DeepComp 6800

grid nodes across China
Grid Technologies and Applications

- Effective sharing of hardware, software, data, information, and knowledge
  - Seamless access to services
- Life cycle support to applications
  - Development, testing, deployment, and operation
- Applications are the driving force
- Emphasize feedback from applications to research
- Emphasize cooperation between applications and technology teams

Grid software development

- Grid system software
  - Interfacing to heterogeneous systems
  - Resource management
  - Scheduling
- Grid application development environment
  - Portal based
- Grid user environment
  - Grid browser
  - GSML
Grid Applications

Resource and environment
- Geological Survey Grid; Digital Forest Grid
- Seismic Imaging Grid;

Research
- Scientific Data Grid (astronomy);
- Bioinformatics Grid; New Drug Discovery Grid

Services
- Traffic Information Grid
- Meteorological Application Grid

Manufacturing
- Aviation Grid
- Simulation and Manufacturing Grid

China Meteorological Application Grid

Numerical weather prediction system
- includes data preprocessing, analysis, numerical models, post processing, visualization and verifications etc.

Execution processes are dynamically connected

Enormously complex even if used individually
China Meteorological Application Grid

Numerical Weather Prediction system

- includes data preprocessing, analysis, numerical models, post processing, visualization and verifications, etc.

Grid portal

GridWeather

- a NWP workflow control interface

CVSExplorer

- a code management system

User interface for GARPES model improvement

- to select the appropriate physical parameterization schemes
- to designate forecast domain, available numerical schemes, etc.
The load report of grid resources displayed dynamically by Ganglia within CMAG

GRAPES

GRAPES meso-scale model runs every day on CMAG
Traffic Information Grid

Showing road status
Predicting bus arrival time
Optimal route selection
Multiple accesses
  - Web
  - Mobile phone
  - Touch screens
Overview of CROWNE

China Research and Development Environment Over Wide-area Network

- Duration 2002 - 2006
- Group Members (Stage 1): 7 Universities and 5 Institutes, such as Beihang University, Peiking U., Tsinghua U., NIC/ CAS, domain partners, etc.
- Focus on service Grid R&D, testbed and its applications
Overview for ChinaGrid

- Sponsored by China Ministry of Education
- Since 2003, Supported by National High-Tech Program (863 Program)
- Goal: Connecting Resources over CERNET, building an application Grid for China
- 20 Universities are involved in ChinaGrid

Main Messages

- China has well established programs and a critical mass of research in the Grid technologies area
- There are many research and application areas in common with potential for collaboration
- Call 6 aims to link existing Chinese initiatives with corresponding activities in the EU
- Towards establishing a long-term co-operation framework
- Contact information of main Chinese initiatives will become available in February at: www.gridatasia.net