The EUAsiaGrid Project

paving the way towards a global e-Science infrastructure in the Asia-Pacific region

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for the EUAsiaGrid Consortium

4th EGEE User Forum / OGF 25

Catania, 5/3/2009

Partners of the project

1. **Istituto Nazionale di Fisica Nucleare (Italy) (coordinator)**
2. **CESNET (Czech Republic)**
3. **University of Manchester (United Kingdom)**
4. **HealthGrid (France)**
5. **Ateneo de Manila University (Philippines)**
6. **Australia National University (Australia)**
7. **Academia Sinica (Taiwan)**
8. **Advanced Science and Technology Institute (Philippines)**
9. **Hydro and Agro Informatics Institute (Thailand)**
10. **Infocomm Development Authority (Singapore)**
11. **Institute of Information Technology (Vietnam)**
12. **Institute Teknologi Bandung (Indonesia)**
13. **National Electronics and Computing Technology Center (Thailand)**
14. **University Putra Malaysia (Malaysia)**
15. **MIMOS Berhad (Malaysia)**

- CSA funding scheme

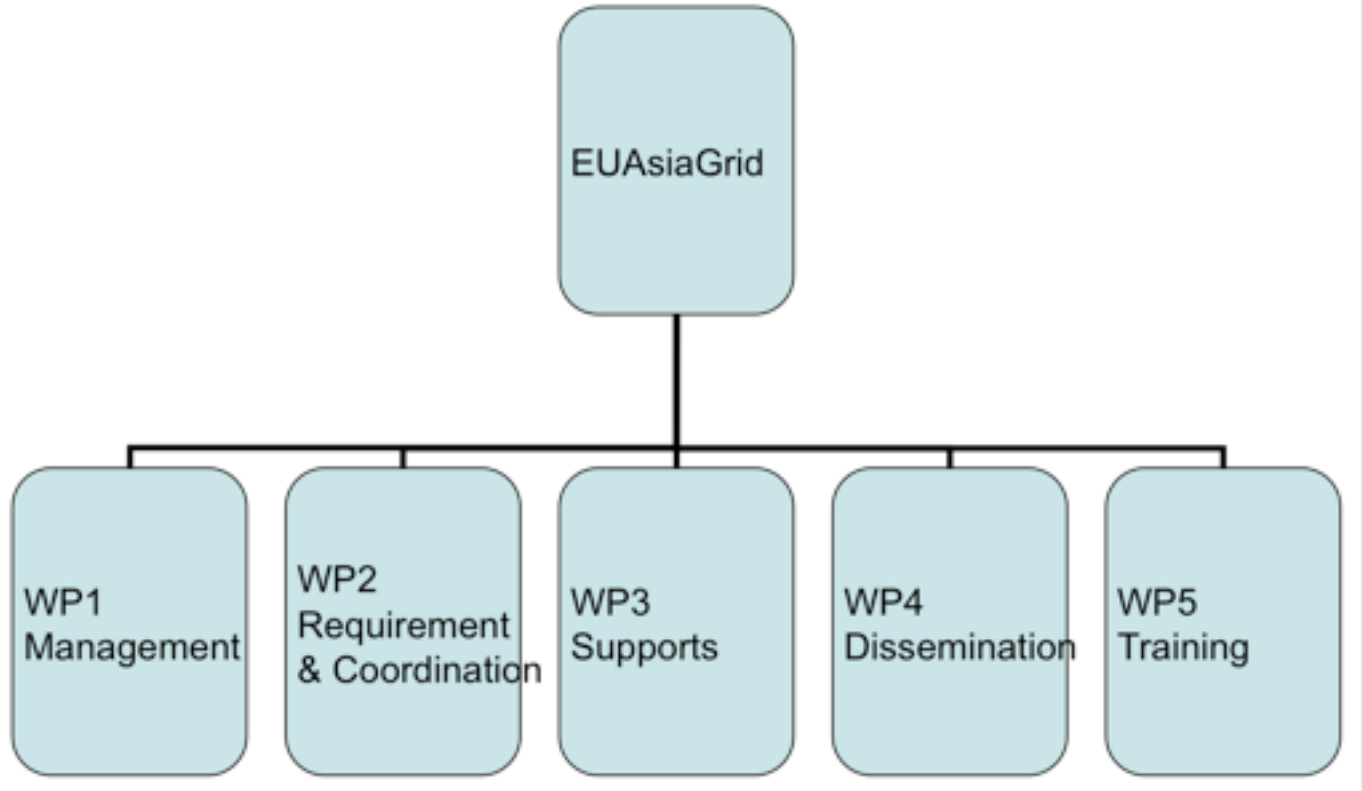
-1/4/2008 – 31/3/2010

- Collaboration with:
EGEE-III
EU-IndiaGrid,
EU-ChinaGrid
EGI_DS

- It is expected to run on Asia-Pacific EGEE infrastructure, but is not building or operating it

- Its main actions will be to spread dissemination, provide training, support scientific applications and monitor the results.

Breakdown in work packages



EUAsiaGrid Objectives

Promote awareness in the Asian countries of the EGEE infrastructures, middleware and services by means of specific dissemination activities, such as workshops, training events, conferences, and hands-on demonstrations;

Capture local e-Science user **requirements** in terms of resources needed, Grid services, application software, and training needs, building on results of the EGI_DS project;

Build a EuroAsian Grid community by identifying and aggregating new and existing user communities into a virtual Grid-based research space;

Assist regional integration with the wider Grid infrastructure in collaboration with the EGEE III Asian Federation and the EUChinaGrid and EU-IndiaGrid projects, thus significantly contributing to the creation of a human network in the area of Grids, e-Science and e-Infrastructures between Europe and Asia;

Promote common e-Science applications in Asia and Europe, by supporting the early user communities already engaged in Grid applications (Life Science, Particle Physics), and engaging new ones by coordinating common actions of dissemination and training;

Provide specific **training** materials and events targeted to the needs of users in the Asian countries as established in part in Objective 2, and in part building on the experience gained from the EUChinaGrid and EU-IndiaGrid projects.

Foster **international cooperation** by working in synergy with members of the EGEE II Asian Federation, and the EU-IndiaGrid and EUChinaGRID projects.

- Gathering information from the partners
  - General information about state of adoption of grids
  - More specific and short-term, than roadmaps

- Topics
  - What is the state of grid adoption in your country?
  - What is your role in this?
  - What are your plans - what do you want to do and achieve through EUAsiaGrid?
  - What are the requirements for achieving your goals?

WP2 - Survey (NCeSS)

- Aimed at application researchers (early adopters, not the unengaged)
- English language master copy and translations to Chinese and Thai (Bahasa in preparation)
- Online and paper versions
- Dissemination and administration through appointed local survey coordinators
  - Disseminated to 400+ researchers in Thailand, expect results in late spring
- Important to follow up contacts through WP3
- Topics:
  - Welcome, General Information
  - Data Resources, Compute Resources
  - Visualisation, Teleconference, Remote Instrumentation
  - Network Connectivity
  - Applications and Usage
  - Support and User-Designer Relations
  - Training
  - Future Plans

WP3: Application Support (CESNET)

- Objectives
  - Attract user communities through explicit support of applications
  - Start with a set of applications already running on the EGEE
  - Search for new user communities that can benefit from the access to a Grid infrastructure
  - Establish appropriate Virtual Organizations (VOs)
- First runners
  - HEP, Biomedical & Bioinformatics
  - Computational Chemistry, Social Science
  - Disaster Mitigation
  - Cultural heritage
- Potential adopters
  - Biodiversity, Financial
  - Mathematics, Operational research
  - Natural language processing

WP3 - EUAsiaGrid VO (CESNET, ASGC)

- Generic, application neutral, regional VO for Asia Pacific region
- Based on "catch-all" approach establish in EGEE

- Current state:
  - Technical set-up finished
  - VO registered in EGEE CIC portal
  - Start of end users/communities registration
  - Start of deployment high-level application tools
  - Start of resource contribution
  - All partners have set up RA/CA services
  - Certification process on-going
    (3 out of 9 sites have been certified production ones,
    4 sites are under the certification process)
  - Up to now 24 users from partners have joined VO
    (ASGC, ASTI, UPM, MIMOS, NECTEC, UK, CZ)
  - 5 partners have available UI to access resources

WP3 - Issues and Challenges

- Identified problematic areas
  - Already existing Grids within AP region are mostly built on Globus based solutions, interest in Desktop Grids is raising
  - No mature use of gLite Grid outside ASGC
  - Not hierarchically strictly monitored model of involved communities (except the HEP community)
- Challenges to be tackled
  - All partners have CA or ASGCCA RA at their Institutes
  - Specific user support webpage provided and first line help from EGEE APROC for daily usage and site operation support
  - User space will be extended soon when pilot user groups of each partners joined those identified applications
  - Training, online information and helpdesk services, and simplified workflow are all necessary to lower the barrier to new Grid users
  - Application-driven approach most effective to get users on board
  - Interest in Desktop Grids in Asia-Pacific region, need for integration

WP3 - Computational Chemistry (CESNET)

- Charon system (high-level middleware layer) being installed at primary EUAsiaGRID VO UI
- Plans to support a set of freely available computational chemistry packages through Charon

- AutoDock http://autodock.scripps.edu/
- Gromacs http://www.gromacs.org/
- Abinit http://www.abinit.org/
- Dalton http://www.kjemi.uio.no/software/dalton/dalton.html

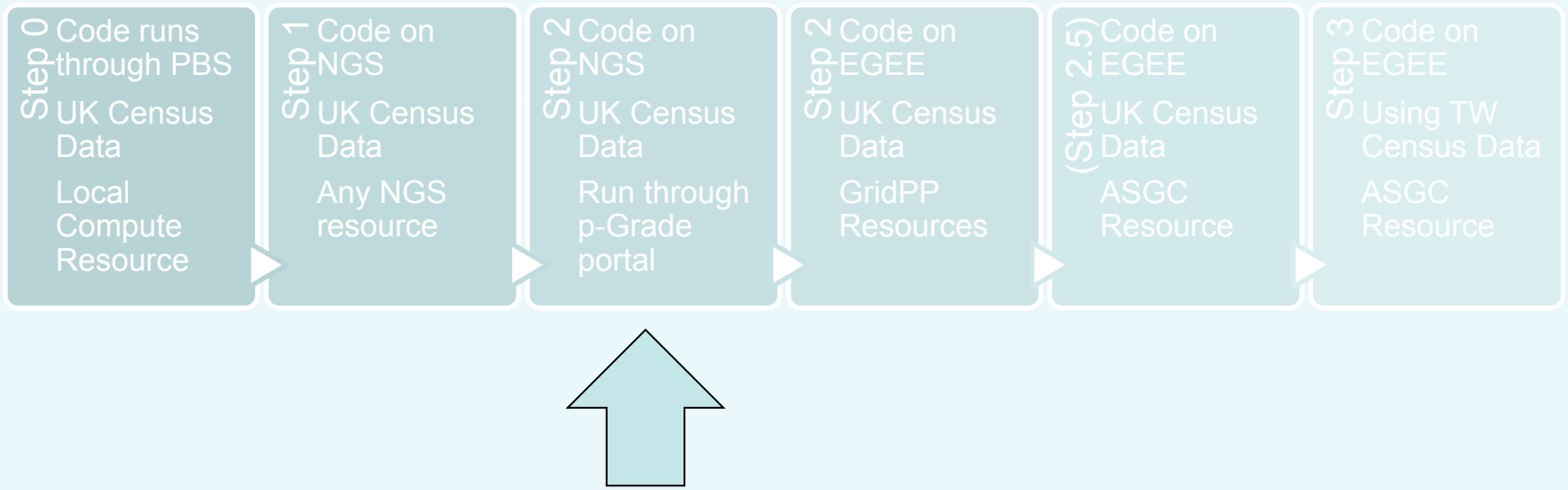
WP3 - Social Simulation (NCeSS)

- Social scientists are not traditional users of advanced ICTs
- However:
  - Increased availability of data about social phenomena
  - Issues with data integration
  - Challenges from commercial sector
  - New analytical methods
- Social simulation developed as part of MoSeS node of NCeSS
- Using agent-based simulation to project population forward in time by 25 years
- Simulate the impact of distinct demographic processes such as mortality, fertility, health status, household formation, migration
- E.g., to inform policy making – what impact do policy decisions have
- Requirements include computation, data integration and visualisation

WP3: Social Simulation (NCeSS)

- Generation of a synthetic model of the target population
  - Based on real census and survey data
  - Works with 'public release' versions of census that are restricted, e.g., to 1% of population (anonymisation)
  - Reconstructed model has same attributes as real population and same number of individuals but is still anonymised
  - Can use geographic segmentation to run in parallel
  - Uses genetic algorithms to generate synthetic model
  - Attributes of the model population need to match attributes of the real one, e.g.,
    - overall demographic structure
    - number of students in university areas,
    - number of multi-car households in suburban areas etc.

WP3 - Social Simulation (NCeSS)



Currently porting population reconstruction code to EGEE, investigating Taiwan data assets and exploring other links, e.g., with healthcare research

Setting up e-Social Science VO

WP3 - Application Support at ASGC

- High Energy Physics
  - ATLAS and CMS Tier1 Center and APROC Services
- Life Science Application
  - Support of gLite-enabled Virtual Screening Service
  - Improve autodocking drug discovery performance & scalability with the DIANE2
- Support for gLite adoption and integration
  - Grid Application Platform (GAP) support to reduce application development cost
- New application Development
  - General virtual screening service for drug discovery, Earthquake wave simulation, Carbon Flux & Ecological surveillance, Global Earth Observation Grid (GEOGrid)
  - Application porting, integration and development
  - Integration Grid Enabled Workflow system with gLite

WP3 – HEP (ASGC in WLCG)

- One of the Most Reliable Tier1 sites in the world (98.85% reliability in 2008)
- Worldwide Grid Asia Pacific Regional Operation Center
- Most significant networking performance (7.3 Gb/s) between Asia and the rest of the world
- Tier1 of WLCG, ATLAS and CMS

Canada – Triumf (Vancouver)
France – IN2P3 (Lyon)
Germany – Forschunszentrum Karlsruhe
Italy – CNAF (Bologna)
Netherlands – NIKHEF/SARA (Amsterdam)
Nordic countries – distributed Tier-1
Spain – PIC (Barcelona)
Taiwan – Academia SInica (Taipei)
UK – CLRC (Oxford)
US – FermiLab (Illinois)
– Brookhaven (NY)

WP3 – BioMed (HealthGrid)

- From the Consortium:
  - UPM, AdMU, ASTI, ITB, ASGC, ANU, IAMI, MIMOS, NECTEC and HealthGrid
- From outside the Consortium
  - CNRS
  - ChonNam National University (South Korea)
- Present applications
  - GATE
  - WISDOM
  - CREED

WP3 – BioMed (GATE)

- Geant4 Application for Emission Tomography (GATE)
  - Simulation toolkit adapted to nuclear medicine
  - Innovative feature: inclusion of time-dependent effects
- Grid used to improve and speed up simulations.
  - Requires Geant4: large, complex package
  - Individual simulations not easily divisible
- It is a well known application deployed in EGEE since years
- Collaboration with Vietnam

WP3 – BioMed (WISDOM)

- WISDOM aims at developing new drugs for neglected and emerging diseases, with a special focus on malaria
- It is deployed on EGEE since 2005 and had three massive campaign (WiSDOM-I, Avian Flu, WISDOM-II)
- Calculations used FlexX from BioSolveIT (3-6k free, floating licenses) in addition to Autodock
- Several data challenges have been produced and target for Malaria are being patented.

- Evolution of WISDOM to a pan Europe-Asia-Pacific Network of surveillance for emerging diseases being setup
- Collaboration of most partners in EUAsiaGrid led by CNRS
- External partners from South Korea, Malaysia/Singapore

WP3 – BioMed (CREED)

- Clinical Repository for Ethical E-infrastructure & Data sharing
- New activity based on a partnership between
  - 5 Taiwanese hospitals
  - 4 French hospitals
  - 1 French SME (Maat France)
  - ASGC
  - HealthGrid

WP3 - Asian Flu Data Challenge II

Biology goals

- ✓ Refine 20,000 high-score compounds with 8 target Avian Flu virus
- ✓ Enable user select compounds and targets for virtual screening research on different diseases

Grid goal

- ✓ Provide a flexible and production virtual screening Grid application service integrating the gLite middleware to EUAsiaGrid partners
- ✓ Study on Grid Virtual Screening the deployment in EUAsiaGrid

Partners

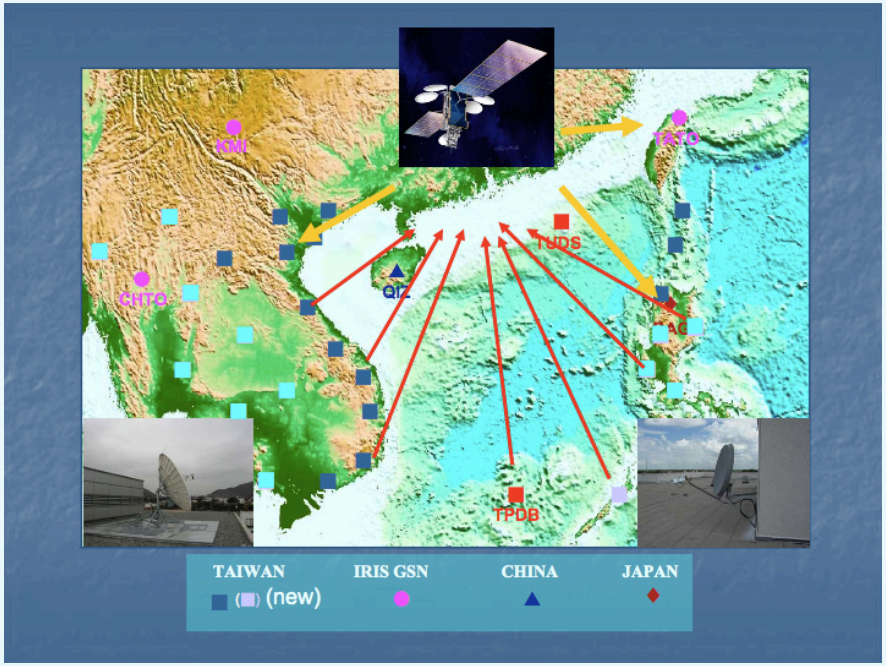
- ✓ ASGC, Genomic Research Center (AS), All EUAsiaGrid Partners

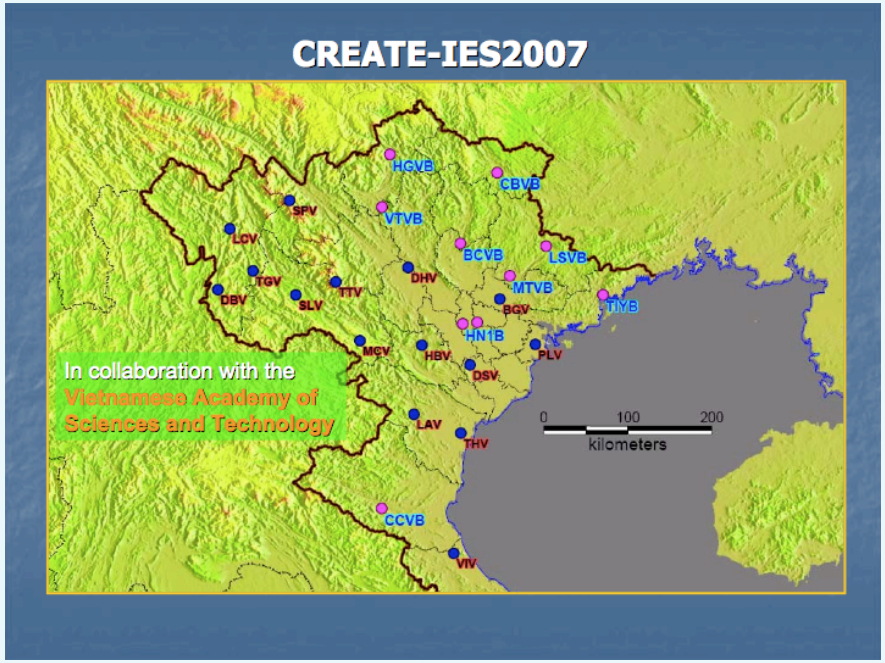
Schedule

- ✓ Prepare the Avian Flu DC2 refined 20,000 compounds before 28 Feb.
- ✓ Scientific data analysis before 20 April, to present at ISGC 2009
- ✓ Avian Flu Drug Discovery Project has been awarded as Best Demo & Runner-up Award in EGEE'07 and EGEE'08

WP3 - Earthquake and Tsunami monitoring

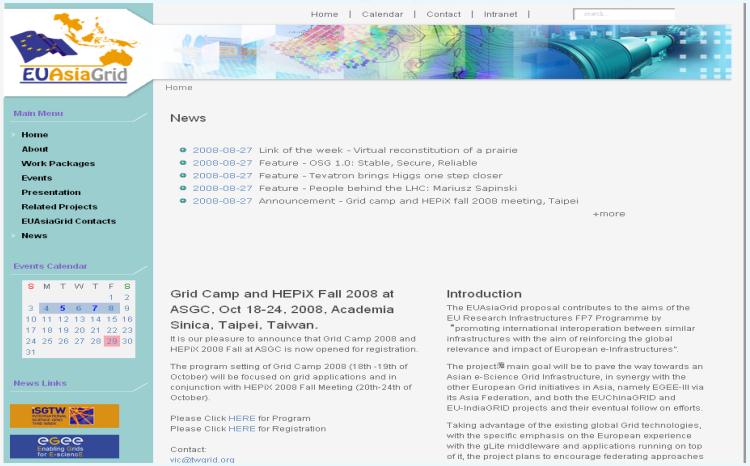
- Philippine Institute of Volcanology and Seismology (PHIVOLCS)
- Vietnamese Academy of Science and Technology
- The Incorporated Research Institutions for Seismology (IRIS), Global Seismic Network (GSN)
- Institute of Earth Science & National Central University, Taiwan



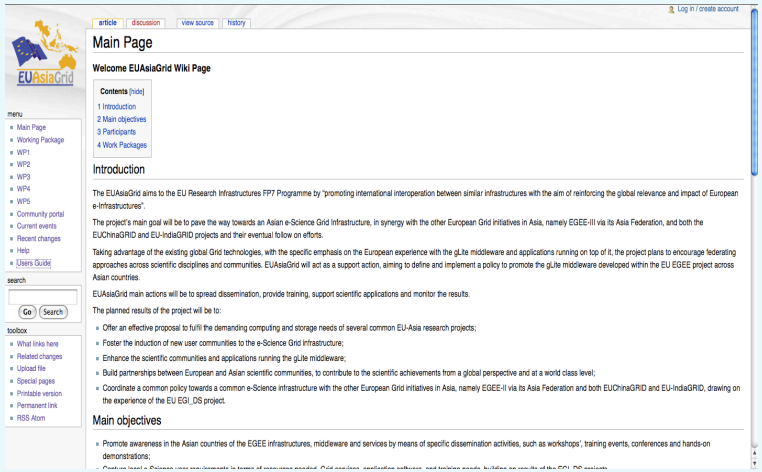


WP4: Dissemination (AS)

- **EUAsiaGrid Website**
  www.euasiagrid.eu



- **EUAsiaGrid Wiki Page**



WP5: Training - GILDA

- GILDA is a INFN Laboratory for Dissemination Activities
- It is a "de facto" standard t-Infrastructure adopted both by EGEE and several EU-FP6 and FP7 projects
- It is a complete suite of grid elements and applications fully dedicated to dissemination purposes and pre-porting of new applications to EGEE Infrastructure
- It runs the latest production (stable) version of LCG and gLite Grid middleware
- Easy entry point for new users/communities without disruption of production systems of Grid projects

WP5: Training - GILDA

https://gilda.ct.infn.it

WP5: Training events (INFN & AS)

- **Training events Organized in 2008**
  - *28 – 31 Jul 2008 EUAsiaGrid Tutorial, Kuala Lumpur, MY (14 People) http://www.mimos.my/EUAsiaGrid*
    (Operation/Application focus)
    »
  - *18 – 19 Oct 2008 Grid Camp, Taipei, Taiwan (30 People) http://indico.twgrid.org/conferenceTimeTable.py?confId=471*
    (Application focus)

- **Training events Planned for 2009**
  - *18-19 April 2009 EGEE tutorial, Taipei, Taiwan co-located with ISGC 2009 & EUAsiaGrid Meeting*
  - *27 Jul–7 Aug 2009 EUAsiaGrid Summer School, Kuala Lumpur, MY*
  - *1 event in Vietnam (in cooperation with CNRS)*
  - *1 event in Philippines*
  - *1 event in Indonesia*

Conclusions

- EUAsiaGrid is now entering a more mature phase
- After the SPR and with the data from the survey a roadmap to pave the way towards a global e-Science infrastructure in Asia Pacific region is being defined
- The extension of EGEE is not only geographical but also to other scientific domains
- In addition to HEP, Computational Chemistry and Biomed & Bioinformatics also Social Sciences, Disaster Mitigation and Cultural Heritage are involved in the project
- Many training and dissemination events have taken place in 2008 and a richer programme is being implemented for 2009
- Any group interested in collaboration, any proposal for new activities are very welcome