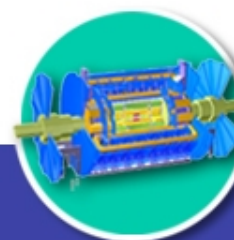
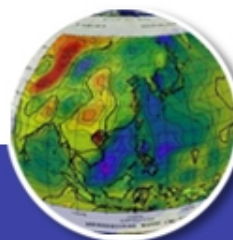


# EUAsiaGrid – e-Infrastructure Platform for Asian-Pacific Region

**Jan Kmuníček, Marco Paganoni**  
**Alex Voss, Luděk Matyska**

**CESNET, Czech Republic**  
*EGEE User Forum V, Uppsala, Sweden*





# Outline

- **EUAsiaGrid project**
- **Application achievements**
  - Data challenges
  - Application domains supported
  - Underlying infrastructure
- **Sustainability analysis**
  - Roadmap document
- **Beyond EUAsiaGrid**

# EUAsiaGrid consortium



- 01** Istituto Nazionale di Fisica Nucleare (Italy) (coordinator)
- 02** CESNET (Czech Republic)
- 03** University of Manchester (United Kingdom)
- 04** HealthGrid (France)
- 05** Ateneo de Manila University (Philippines)
- 06** Australia National University (Australia)
- 07** Academia Sinica (Taiwan)
- 08** Advanced Science and Technology Institute (Philippines)
- 09** 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)
- 16** Institut de la Francophonie pour l'Informatique (Vietnam)
- 17** National University of Singapore (Singapore)

# EUAsiaGrid project aims

- **Promote awareness** in the Asian countries of the EGEE infrastructures, middleware and services
- **Capture** local e-Science **user requirements** in terms of resources, Grid services, applications
- Build a EuroAsian Grid community
- **Assist regional integration** with the wider Grid infrastructure in collaboration with the EGEE III
- Promote common e-Science applications in Asia and Europe
- **Provide specific training** materials and events targeted to the needs of users in Asian countries

# Internal project structure

- **WP1**
  - Project management
- **WP2**
  - Requirements capture
- **WP3**
  - Support of applications
- **WP4**
  - Dissemination
- **WP5**
  - Training

**INFN**

M. Paganoni

**UNIMAN**

A. Voss

**CESNET**

L. Matyska

**ASGC**

S. Lin

**INFN**

M. Fargetta

# Application achievements

- **Data challenges as activity**

- in which more than two Asian partners take part
- that requires non-trivial use of resources
- that requires long sustainable effort
- that utilizes grid for collaboration, compute power and necessary logistic arrangements

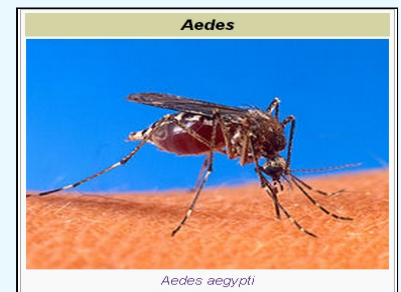
- **EUAsiaGrid data challenges**

- Dengue fever forerunner, already finished
- Earthquake mitigation key area, currently active
- Climate change key area, currently active
- Social simulations newly derived, planned



# Data challenges

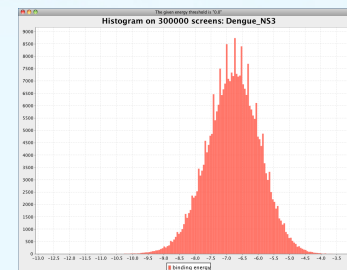
- **Dengue fever**
  - used as a test case of established infrastructure
  - kind of feasibility study to computationally evaluate EUAsiaGrid environment
- **Objective**
  - reduce time and money for drug discovery by Grid *in silico* simulation
  - 2,5 B people are at risk, 50 M cases/year in more than 100 countries
  - 95% cases are children younger than 15 years in South-East Asia



# Data challenges

- **Dengue fever**

- screening on 300 000 compounds
- extraction of the top-most 10 % compounds according to their binding energy
- preparation for the first phase wet-lab assay for the most potential 200 compounds



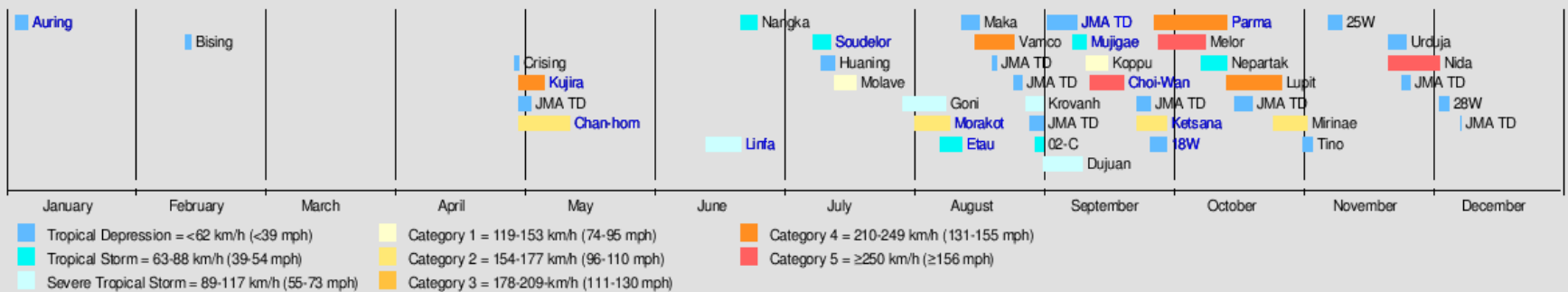
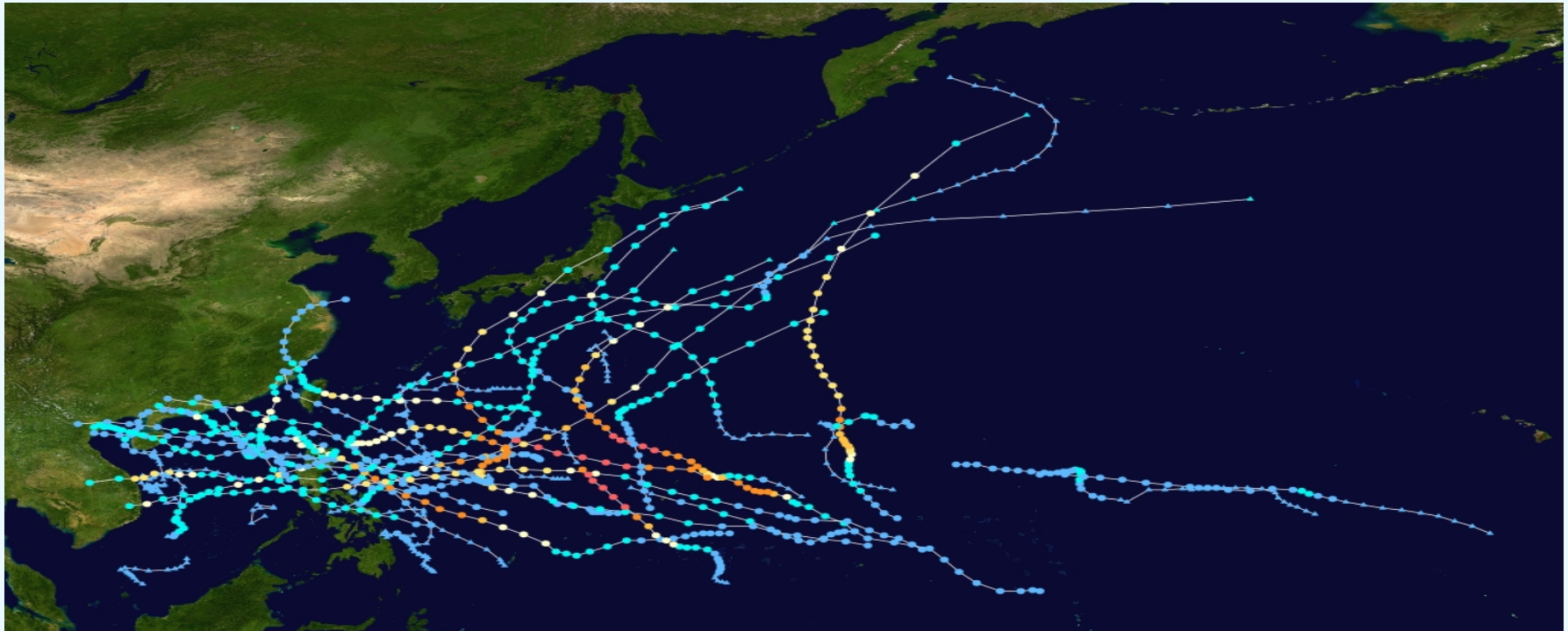
No. of docking jobs	300 000
Estimated computing power	4 167 CPU*days
Experiment duration	60 days
Cumulative results	42,5 GB
Compute resources	268 cores
No. of used CEs	6



# Data challenges

- **Climate change**
  - climate change causes more frequent and
  - severe weather extremes, the “unusual” events are becoming “usual” and more frequent
- **Objectives**
  - understand changes and trends of sea level and weather conditions
  - track sea surface temperature and sea surface height anomalies
  - forecast typhoons and change of season
  - pilot platform for weather simulation on Grid

# Data challenges



# Data challenges

- **Earthquake mitigation**
  - provide improved risk analysis by
  - better understanding of fault rupture mechanism
  - detailed knowledge of local geological structure
  - more accurate simulation of 3-D seismic wave propagation
- **Objectives**
  - collect as much data as possible for each earthquake events and related disasters
  - sensor networking and earthquake data center
  - hazard mapping, early warning, also for tsunami

# Data challenges

Welcome!

This wizard will help you set up simulation parameters:

- Location and tomography model
- Earthquake Source (CMTSOLUTION format)
- Stations

Available models: Global (1D\_isotropic\_prem)

Global (1D\_isotropic\_prem)  
Southeast Asia (1D\_isotropic\_prem)  
Taiwan (1D\_isotropic\_prem)

**Simulation Wizard**

**Earthquake Source**  
choose a source for simulation.

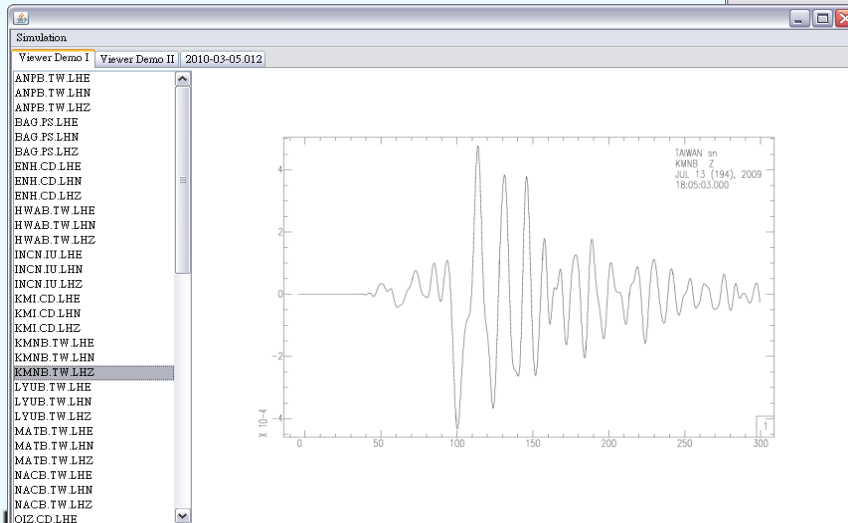
Source

☐ User Uploaded:

☒ Global CMT Site: 100700A

Information

Description: MINDORO, PHILIPPINE ISLA  
Date: 2000 10/07  
Time: 08:49:43  
Location  
Latitude: 13.4100  
Longitude: 120.5200  
Depth: 135.8000  
Magnitude  
Body-wave: 5.0  
Surface-wave: 0.0  
Moment Tensor  
Mxx: 5.067000e+23  
Myy: -1.693000e+23  
Mzz: -3.374000e+23



**Simulation Wizard**

**Stations**  
add extra stations.

**New Station**

Station:  TW

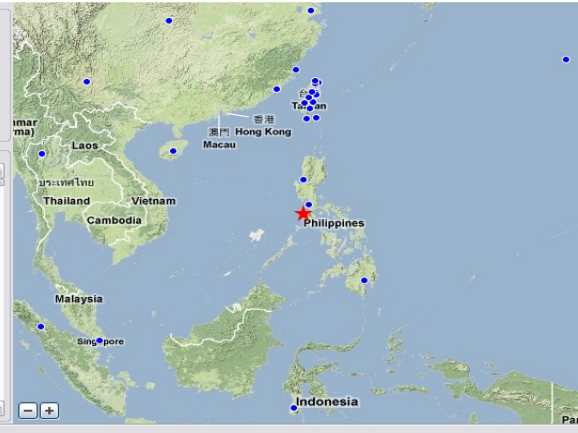
Latitude (deg):

Longitude (deg):

Elevation (m):

**Station List**

MCK AK[63.73230, -148.9349]  
CTAO AS[-20.08820, 146.2545]  
KONO AS[59.64910, 9.598200]  
MAJO AS[36.54090, 138.2083]  
ZOBO AS[-16.27000, -68.12500]  
ASES AZ[33.62080, -116.4664]  
EGN AZ[33.49150, -116.6670]  
CRY AZ[33.56540, -116.7373]  
ELKS AZ[33.58130, -116.4496]  
FRD AZ[33.49470, -116.6022]  
GLA AZ[33.05120, -114.8270]  
GLAC AZ[33.60140, -116.4781]  
KNW AZ[33.71410, -116.7119]  
LVA2 AZ[33.35160, -116.5615]  
MONP AZ[32.89270, -116.4225]  
PPO AZ[33.61170, -116.4594]



< Back Next > Submit Cancel



# Application achievements



- **Application domains supported**
  - Computational chemistry
  - Bioinformatics and biomedical research
  - Digital culture and heritage
  - Trade modelling
  - Engineering physics
  - Ecology and biodiversity
  - ....
- **Final Report on Applications under development!**



# Application achievements

- **Currently on-going studies and analyses**
  - g-Info - grid-based international network for surveillance
  - HOPE – collaborative platform for telemedicine
  - GAP GVSS – virtual screening service
- **Application repository**
  - expected to contain up-to-date application programs information
  - description of their status, type of availability, porting process and instructions for direct utilization within EUAsia VO

# Undelying infrastructure

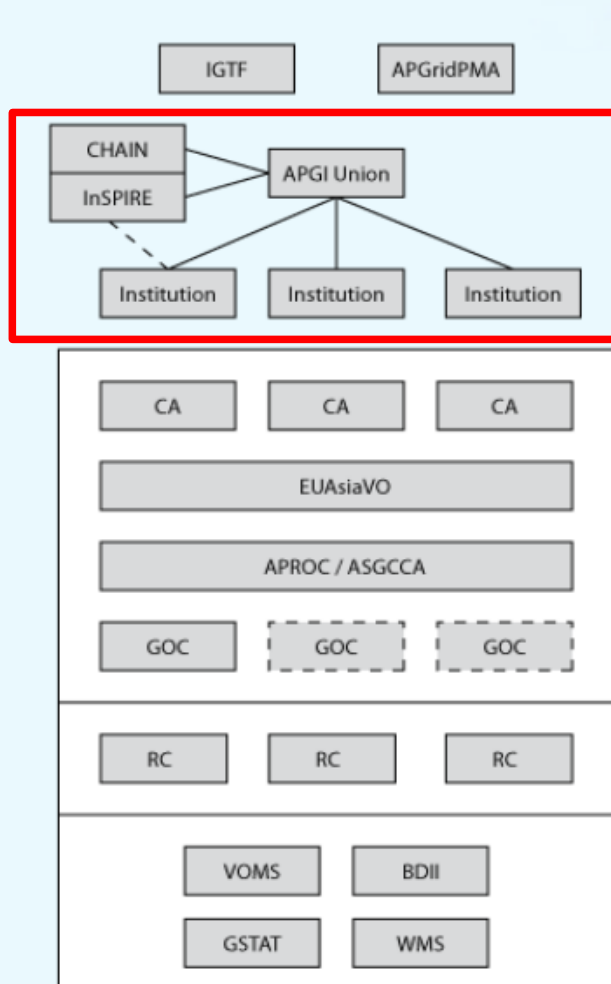
- **EUAsia virtual organization**
  - generic, application neutral VO for AP region
  - starting from ASGC and UPM, now also EU resources from CESNET and INFN
  - based on “catch-all” approach established in EGEE for researchers from any discipline with a simplified registration procedure
- **Resources in EUAsia VO**
  - ~ 600 CPUs and 65 TBs, about 200 users
  - all partners have UI to access resources
  - all partners have set up RA/CA

# Sustainability analysis

- **Organisational and technical roadmap towards**
  - a robust, persistent and sustainable e-Infrastructure in Asia-Pacific region
  - integrated with EGI and the worldwide e-Infrastructure
- **Asia-Pacific Grid Initiative**
  - APGI Union as interim model
  - JRU for participation within international projects



# Sustainability analysis



Governance

Certification

International Level

National Level

Support Structures

Certification

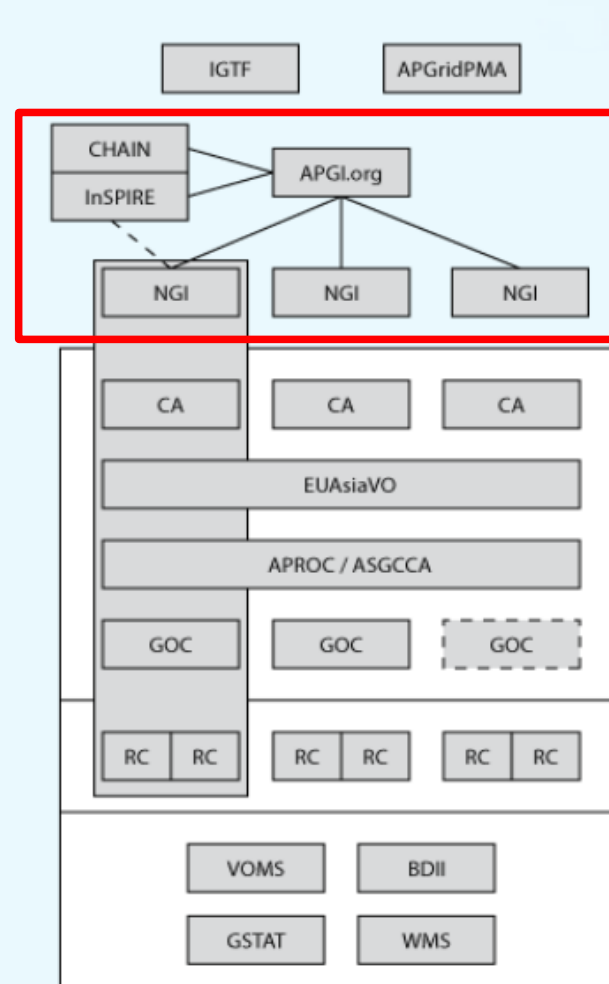
VO Management

Catch-All Support & Certification

National-Level Support

Resources

Core Services



Governance

Certification

International Level

National Level

Support Structures

Certification

VO Management

Catch-All Support & Certification

National-Level Support

Resources

Core Services

# Sustainability analysis

- **Heterogeneity in policy formation and authority within and between countries makes an easy adoption of EGI/NGI model impossible**
- **APGI-Union as an interim model and transition mechanism from (proto-) NGIs into full-fledged NGIs**
- **APGI-Union**
  - institutions that are (emerging) resource providers
  - will evolve into APGI.org to reflect EGI/NGI model
  - will lobby at national and regional level for establishment of NGIs and suitable policy and funding support for APGI.org





# Beyond EUAsiaGrid

- **Roadmap implementation**
  - establishment of JRU, APGI Union
  - regular roadmap updates
- **Project CHAIN**
  - Asian-Pacific support in global scale
  - Coordination and Harmonization of Advanced e-INFrastructures
  - project accepted by European Union
  - negotiations currently on-going