**EGI-InSPIRE**

APGI ANNUAL REPORT

|  |  |  |
| --- | --- | --- |
|  | Date: | 09/04/2014 |
|  | Activity: | **WP1: Management** |
|  | Lead Partner: | **ASGC** |

**Table of contents**

[1. Academia Sinica Grid Computing Centre (ASGC) 3](#_Toc384804670)

[1.1. Activity Summary 3](#_Toc384804671)

[1.1.1. WP2 – NA2 External Relations (Total PM: 12) 3](#_Toc384804672)

[1.1.2. WP3 – NA3 User Community Coordination (Total PM: 30) 4](#_Toc384804673)

[1.1.3. WP4 – SA1 Operations (Total PM:48) 5](#_Toc384804674)

[2. Advanced Science and Technology Institute (ASTI) 7](#_Toc384804675)

[2.1. Activity Summary 7](#_Toc384804676)

[2.1.1. WP2 – NA2 External Relations (Total PM: 2) 7](#_Toc384804677)

[2.1.2. WP3 – NA3 User Community Coordination (Total PM: 20) 7](#_Toc384804678)

[2.1.3. WP4 – SA1 Operations (Total PM: 20) 7](#_Toc384804679)

[3. Institut Teknologi Bandung (ITB) 9](#_Toc384804680)

[3.1. Activity Summary 9](#_Toc384804681)

[3.1.1. WP2 – NA2 External Relations (Total PM: 1.64) 9](#_Toc384804682)

[3.1.2. WP3 – NA3 User Community Coordination (Total PM: 5.67) 9](#_Toc384804683)

[4. *Inter-University Research Institute Corporation High Energy Accelerator Research Organization (KEK)* 10](#_Toc384804684)

[4.1. Activity Summary 10](#_Toc384804685)

[4.1.1. WP4 – SA1 Operations 10](#_Toc384804686)

[5. Korea Institute of Science and Technology Information (KISTI) 11](#_Toc384804687)

[5.1. Activity Summary 11](#_Toc384804688)

[5.1.1. WP4 – SA1 Operations (Total PM: 24) 11](#_Toc384804689)

[6. National Science and Technology Development Agency (NSTDA) 12](#_Toc384804690)

[6.1. Activity Summary 12](#_Toc384804691)

[6.1.1. WP2 – NA2 External Relations (Total PM: 0.2) 12](#_Toc384804692)

[6.1.2. WP3 – NA3 User Community Coordination (Total PM: 17.7) 13](#_Toc384804693)

[*7. National University of Singapore (NUS)* 14](#_Toc384804694)

[7.1. Activity Summary 14](#_Toc384804695)

[7.1.1. WP4 – SA1 Operations (Total PM: ) 14](#_Toc384804696)

[7.1.2. WP2 – NA2 External Relations (Total PM: ) 14](#_Toc384804697)

[*8.* University of Melbourne (UNIMELB) 15](#_Toc384804698)

[8.1. Activity Summary 15](#_Toc384804699)

[8.1.1. WP2 – NA2 External Relations (Total PM: 4) 15](#_Toc384804700)

[8.1.2. WP4 – SA1 Operations (Total PM: 68) 15](#_Toc384804701)

[*9.* Universiti Putra Malaysia (UPM) 16](#_Toc384804702)

[9.1. Activity Summary 16](#_Toc384804703)

[9.1.1. WP2 – NA2 External Relations (4PM) 16](#_Toc384804704)

[9.1.2. WP4 – SA1 Operations (2PM) 17](#_Toc384804705)

# Academia Sinica Grid Computing Centre (ASGC)

## Activity Summary

### WP2 – NA2 External Relations (Total PM: 12)

In the fourth year of the Project, both EGI Technical Forum and Community Forum were participated. ASGC assisted the EGI Project Office to promote the Technical Forum and Community Forum among Asia Pacific region, and coordinated with the PO regarding the communication and execution of financial supporting program to Asian Pacific partners.  Eight delegates from 4 partners (Australia, Korea, Malaysia and Taiwan) attending the EGI Technical Form in Madrid, and 4 partners (AU, KR, MY and TW) will also attend the EGI Community Forum in Helsinki in May 2014

To disseminate the advanced e-Science knowledge to the potential user communities and give them the skills to deploy and use the e-Science infrastructure, ASGC has participated in the following international/local activities:

|  |  |  |  |
| --- | --- | --- | --- |
| **Date** | **Place** | **Events** | **Presentation / Dissemination** |
| March 2014 | Taiwan | ISGC 2014 | 1. Computing and data Infrastructures – AP Region 2. E-Science Development in Asia: Past Experiences and Future Perspectives (Keynote Speech) 3. Disease-Wide Association Study Based on the Taiwan Health Insurance Record 4. Data Laws in Ancient Chinese Text |
| January 2014 | Taiwan | 3rd QCN Tainan Workshop |  |
| Philippines | P-alert Tutorial |  |
| November 2013 | Taiwan | 2nd QCN Tainan Workshop |  |
| September 2013 | Taiwan | 1st QCN Tainan Workshop |  |
| June 2013 | Germany | ISC13 |  |
| May 2013 | Taiwan | National Cheng-chi University, Taipei | Cloud Computing & Big Data Analytics |
| National Yang-Ming University | Challenge of Biomedical Big Data |

In total, ASGC has organized 3 QCN Workshops, 1 P-Alert Tutorial, 1 international conference and 5 Grids/Clouds related Workshops including Security Workshop, dCache Workshop, e-Learning Workshop, ECAI Workshop and WeNMR Workshop.

The International Symposium on Grids and Clouds (ISGC 2014) was held at Academia Sinica in Taipei from 23 to 28 March 2014 with other 5 co-located events. This year there are around 200 attendees from 30 countries to participate. Detailed Conference Program could be found at <http://event.twgrid.org/isgc2014/program.html>.

### WP3 – NA3 User Community Coordination (Total PM: 30)

In the 4th year, ASGC continues focusing on e-Science applications and big data analytics as well as providing user support to the following applications:

**High Energy Physics (HEP):** The most excited news in the last report period is that the Nobel Prize in Physics 2013 was awarded jointly to François Englert and Peter W. Higgs "for the theoretical discovery of a mechanism that contributes to our understanding of the origin of mass of subatomic particles, and which recently was confirmed through the discovery of the predicted fundamental particle, by the ATLAS and CMS experiments at CERN's Large Hadron Collider" As Rolf Heuer, CERN DG, said “Results are only possible due to extraordinary performance of accelerators – experiments – Grid computing”.

ASGC continued supporting ATLAS and CMS which are the largest user communities in terms of the resource consumption. In the 4th reporting period, for ATLAS the inbound transfer data volume to ASGC reached 6,093 TB and outbound transfer volume from ASGC to other T1s/T2s reached 3,397 TB. For CMS, the inbound transfer data size to Taiwan reached 201 TB and outbound transfer rate from Taiwan to other T1s and T2s reached 819 TB. Taiwan WLCG Tier-1 and Tier-2 Centres finished 11.2M jobs in the fourth EGI years, and provided 239.8.M normalised CPU time (HEPSPEC06.Hours).

**Bioinformatics and Biomedics:**

1. WeNMR: ASGC continued to support WeNMR communities in the third reporting period. A 1-day WeNMR Workshop has been organized in conjunction with the ISGC 2014. There are over 37 attendees registered in the Workshop. In addition to the WeNMR applications, we also introduce the interactively high throughput virtual screening service, GVSS2, on this workshop.
2. Drug Discovery: ASGC continued to support Drug Discovery communities, co-writing with Korea scholars, the paper “In Vitro Evaluation of Novel Inhibitors against the NS2B-NS3 Protease of Dengue Fever Virus Type 4” has been published (accepted) in the last reporting period.
3. Biomedics: Collaborating with Taipei Medical University, ASGC has access to the Taiwan National Health Insurance (NHI) records of 23M people of age 0 to 100 from 2000 to 2002.This is a rare and unique dataset for the phenotypic disease analysis due to the non-statistically re-sampled nature and completeness of the population in Taiwan. The dataset is big, all pair-wise computation is even bigger. Therefore, the typical Cloud computing technique such as Map-Reduce is employed to generate the necessary dataset for further analysis. It is found a quantitative method that enables distinguishing of the common and rare diseases which is of great value to the decision support of public health policy. In addition, a new Data Law governs the disease comorbidity for any particular disease is also found. A web site to enable researchers to find all pair-wise diseases comorbidity in the demography of sex and all age groups is also under construction.

**Natural Disaster Mitigation:**

1. Earthquake: ASGC continued the collaboration with the Institute of Earth Science and Philippine Institute of Volcanology & Seismology (PHIVOLCS). The status of this collaboration are described as follows: (1) already constructed one broadband seismic station named (PIPB) at the northern Luzon islands, currently, there are 5 broadband stations being installed to continuously monitor seismic activity of the Manila Trench; (2) evaluated the array response and detect ability of the plan South China Sea network, according to analyzed results, it indicated that, in Luzon islands, installation of few seismic stations provided a significant improvement of the ability to detect earthquake and tsunami; (3) 20 QCN sensors, 10 P-alert sensors and 2 servers have sent to PHIVOLCS; as well as (4) held P-Alert Tutorial in PHIVOLCS.

In addition to the collaboration with Philippines, ASGC also put huge amount of effort on promoting QCN (QuickCatcher Network) in Tainan area. Quake-Catcher Network is a collaborative, volunteer-based initiative for developing the world’s largest, low-cost strong-motion seismic network by utilizing sensors attached to internet-connected computers. With the generous support of Rotary Club Taipei and Tainan Education Bureau, ASGC introduces the technology in 50 elementary schools in Tainan. In principle, 5 QCN sensors will be assigned to each school; among them, one sensor for collecting data and the other four for education purpose. For those schools which are located nearby the fault will be equipped with more sensitive 16-bit QCN sensor. A series of training workshop, starting with the installation workshop and followed by the curriculum design workshop, will be planned. The purpose of the installation workshop is to assist teachers to install the QCN sensor whereas that of the curriculum design workshop is to assist teachers to use QCN sensor as a teaching aid and integrate into the local disaster mitigation curriculum. Other than organizing training workshops, the curriculum design competition and science project competition will be organized in 2015 and 2016 respectively. This is a 3-year project, in total, there will be 150 elementary schools in Tainan joining the QCN sensor network. In addition, the programme will be extended to other schools in the neighboring countries such as Japan (Okinawa area) and the Philippines (Manila area).

1. Tsunami Simulation: iCOMCOT is available at http://icomcot.twgrid.org. To integrate existing earthquake early warning systems with a fast calculation system for tsunami threats, iCOMCOT provides an efficient and low-cost tsunami fast calculation system for early warning. The iCOMCOT has been optimized and parallelized in order to meet the requirements of real-time simulation. It performs at least 10 times faster than the original COMCOT. In addition, a flexible and user-friendly grid/cloud-based portal service has been built, which is also made available for mobile devices. A paper on “Development of a Tsunami Early W­­arning System for the South China Sea” has been submitted to the Journal of Ocean Engineering in 2014.

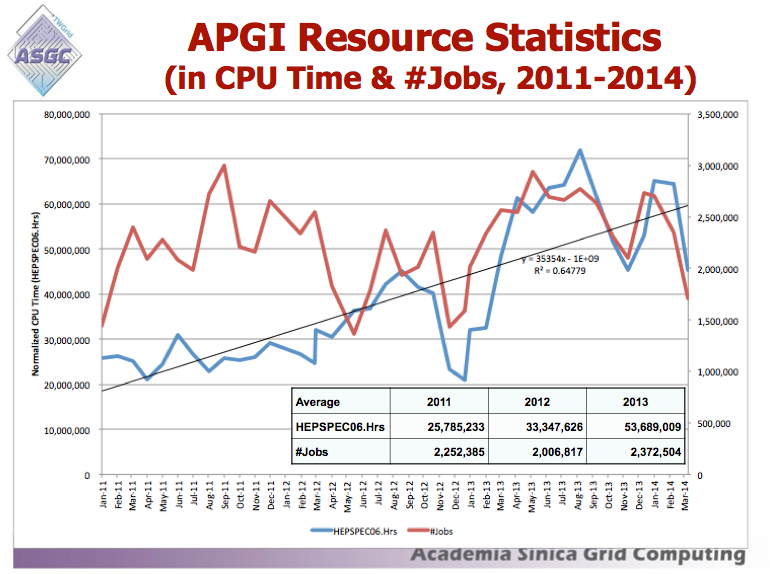
(3) To further the collaboration between Taiwan and Thailand, a delegation led by Dr. Royal Chitradon from the Hydro and Agro Informatics Institute (HAII), Ministry of Science and Technology, Thailand visited ASGC. In the 2-day meeting, various e-Science collaborations including WRF application on climate change, typhoon prediction, QCN/P-alert for earthquake monitoring system, tsunami and storm surge simulation, etc. have discussed.

**Humanity:**

The ancient Chinese text is troublesome since there is no natural delimiter and no Latin style grammar. However, semantic structure may be reflected by the text structure. The materials were chosen are Ming Shilu which literally means “veritable record for the Ming dynasty”. These contain the imperial annals of the [Ming](http://en.wikipedia.org/wiki/Ming_Dynasty) and Qing emperors kept by an official committee of the time. To solve the problem, what has been done is to segment the material with different word lengths, from one character to four characters, and then test if they exhibit some kind of distribution. Our results demonstrate power law distributions for various word-lengths, suggesting that ancient Chinese also follows Zipf's law in a subtle way, and may share some underlying mechanism with other languages.

### WP4 – SA1 Operations (Total PM:48)

ASGC is operating the Asia Pacific Regional Operation Centre (APROC) to extend the EGI infrastructure in Asia Pacific region and maximise the e-Infrastructure reliability to support various e-Science user communities. At this moment, there are 22 production sites from 9 countries (excluding China) joining 12 VOs in the EGI Asia Pacific regional infrastructure. Around 20,590 cores, 25 PB disk space are available from the Asia Pacific resource centres. Currently, there are 1,267 registered users in total according to APGridPMA statistics in January 2014. In terms of normalised CPU time (HEPSPEC06), the monthly average resource utilisation in this region is 60.4M normalised CPU time (in HEPSPEC.hours). The daily average finished jobs have greatly increased from 49,408 in the first project year to 84,462 in the fourth project year.



# Advanced Science and Technology Institute (ASTI)

## Activity Summary

This year ASTI continues to receive new requests for account creation in our HPC facility. Since the facility reached maximum usage with all virtual cores allocated to various virtual clusters and standalone servers, this year we will be upgrading our facility and will be procuring new storage and computing servers.

ASTI continues to collaborate with local partners such as state universities and research organizations as well as international communities such as EGI, PRAGMA, PandaGrid, and EGI-Inspire.

The ASTI HPC Facility, and all HPC-related activities, are managed and handled by one (1) full-time technical staff, as two (2) of ASTI's technical staff handling HPC matters resigned in the early part of 2014. HPC administrative concerns are handled by one (1) management personnel.

### WP2 – NA2 External Relations (Total PM: 2)

ASTI was not able to conduct major dissemination activities for the HPC for the period as the staff have been pre-occupied with another project, so the team merely focused on assisting current HPC users, and accommodating new requests. We were able to create a "ASTI HPC Facility Group" in Facebook, and have recently made effort to disseminate HPC-related concerns to this group. Also, in the early part of March, a group of students from the University of the Philippines College of Computer Science together with their Instructor, visited ASTI and we were able to orient them on the HPC facility and what we do, and a tour to the HPC facility was also part of this activity.

### WP3 – NA3 User Community Coordination (Total PM: 20)

The following user support activities were provided to users/collaborators/partners:

* A dedicated virtual cluster with 52 virtual cores was configured for our partners from the PAGASA (Philippine Atmospheric, Geophysical, and Astronomical Services Administration), the state weather bureau, for their research on the development of an ensemble of climate scenario simulations in the Philippines. This is a continuing activity from last year.
* A dedicated virtual cluster with 28 virtual cores was configured for users from the Ateneo de Manila University-Department of Environmental Science for their research using the Community Climate System Model v4. This is a continuing activity from last year.
* A multipurpose cluster was configured with 68 virtual cores to be shared among graduate students from the University of the Philippines Institute of Environmental Science and Meteorology, researchers from Philippine Genome Center, and scientists from the Manila Observatory. Applications running on the cluster include WRF, RegCM, and various Bioinformatics tools. This is a continuing activity from last year.
* The ASTI HPC facility now also hosts the Meteorological Data Archiving facility which serves as a repository of meteorological data coming from various sources such as satellite, automatic weather stations, Doppler radar, and water level sensors. Users of the facility include researchers from the academe, the Project NOAH (Nationwide Operational Assessment of Hazards), and PAGASA, the state weather bureau. This is a continuing activity from last year.
* Following the visit from the students from the University of the Philippines College of Computer Science, we have already received new account request from at least four (4) students, for their research project.

### WP4 – SA1 Operations (Total PM: 20)

All security updates are applied upon receipt of notification from EGI Broadcast. Server certificates that expired were renewed last August 2012. ASTI’s private cloud which hosts all service endpoints of PH-ASTI-LIKNAYAN is managed using OpenNebula’s Cloud Operations Center web GUI. Since PH-ASTI-LIKNAYAN services are virtual machines that sit on ASTI’s private cloud, it is very easy to backup or migrate these virtual machines in case hardware failure occurs on the physical hosts. PH-ASTI-LIKNAYAN service endpoints are all virtual machines running SL 5.6 and are hosted on ASTI’s private cloud. The following are the certified production service endpoints of PH-ASTI-LIKNAYAN:

|  |  |  |  |
| --- | --- | --- | --- |
| **Hostname** | **Production** | **Monitored** | **Visible to EGI** |
| **APEL - liknayan.pscigrid.gov.ph** | Yes | Yes | Yes |
| **CREAM-CE - liknayan.pscigrid.gov.ph** | Yes | Yes | Yes |
| **gLite-APEL - mon.pscigrid.gov.ph** | Yes | Yes | Yes |
| **Site-BDII - mon.pscigrid.gov.ph** | Yes | Yes | Yes |
| **SRM - se.pscigrid.gov.ph** | Yes | Yes | Yes |
| **UI - ui.pscigrid.gov.ph** | Yes | Yes | Yes |

In summary, ASTI was able to carry out the following activities:

* Continue to maintain and operate the ASTI Private Cloud and all the virtual clusters hosted therein;
* Contribute computing resources to EGI and PRAGMA;
* Provide technical support to partners and users; and
* Maintain the Meteorological Data Archive System.

Following are the plans of ASTI for the year 2014:

Note: As some of the plans in last year's report are either already in progress, or will commence this year (as the funds to carry out these activities will only come this year)

* Hardware Side:
* Expand data center physical spaces and transfer to the new data center (On-going migration to the new Portable Modular Data Center located within ASTI premises).
* Acquire additional compute and storage capacity (To commence in the 2nd Quarter as we are currently awaiting the release of the funds for this).
* Upgrade network infrastructure to Infiniband and 10G Interconnect (This shall be provided by another project on the setup of a Government Fiber Network).
* Catalogue service for searching archived and real-time data.
* Develop standards for data access, storage, and sharing.
* A knowledge-based portal using Wiki application shall be established. This is easily accessible through the web. Users’ training on data access, use of HPC facility, shall likewise be provided.
* Management Side:
* Update of website and other social networking sites for dissemination activities.
* Hire at least four (4) technical project staff to beef up our user support system.
* Make our new accounts application process online.

# Institut Teknologi Bandung (ITB)

## Activity Summary

On the fouth year of the EGI-Inspire project, no major activities has been done. Nevertheless, there are new engagement with new areas, Astronomy Department in ITB and National Institute of Sciences (LIPI). ID-ITB Site was again rebuild, upgraded using new middleware system (EMI). The major problem or obstacle, that we are having difficulties in upgrading or migrating old system (using Glite to EMI) because the lack of knowledge of the people’s in Indonesia.

### WP2 – NA2 External Relations (Total PM: 1.64)

To do dissemination activity, experts or practitioner in grid computing technology are needed. The problem is, there are not so many people with grid expertise in Indonesia. Most researcher in Indonesia are still using cluster computing system. Enganging community during fourth year was using the means of emails. Communication was made with researchers from Astronomy Department in ITB and Indonesian Institute of Sciences (LIPI). As mentioned above, technical support given to new user communities was assistant to get user certificate which is mandatory to be able to access the Grid Infrastructure. In addition, the rebuild of the ID-ITB site was including the user interface system which can be used by any user to access the Grid Infrastructure.

### WP3 – NA3 User Community Coordination (Total PM: 5.67)

During fourth year, communication and coordination with local users’ community has been done through emails, phone calls, and informal meetings. In order to facilitate user communities in Indonesia, ITB provides a Grid site that is connected to the EUAsiaGrid. This site is rebuild last year to the new middleware system.

Coordination with user communities that were involved with the EUAsiaGrid Project and other user communities that could benefit from the use of e-Infrastructures has been maintained. The user communities established from previous activities are those from Weather Forecast, Disaster Mitigation, and Computational Chemistry.

Researchers from Indonesian Institute of Sciences (LIPI) was also have a cluster computing system. They are intended to connect their cluster to collaborate with CERN in ALICE Project as a Virtual Organization (VO). We assist them to have user certificates needed to connect to the Grid Infrastructure. In the future, we are plannign to have closer discussion about the Grid infrastructure development and application.

Astronomy Department are in need for large computational resources. The recent project is to calculating dynamic evolution of Near-Earth Asteroid for prediction. But this need are yet to be further analyze how to be supported using grid infrastructure. They are currently using their available cluster system, and possibly going to utilize the High Performance Computing Facility (Cluster) in Computational Chemistry Department.

Technical Services done in the fouth year was the rebuild of the ID-ITB site and supporting the developemtn of High Performance Computing Facility operated by Computational Chemistry Department. The ID-ITB site upgrades are constrained by the lack of experts and technical staff in grid system.

# *Inter-University Research Institute Corporation High Energy Accelerator Research Organization (KEK)*

## Activity Summary

### WP4 – SA1 Operations

KEK, High Energy Accelerator Research Organization, is the government funded multidisciplinary laboratory covering particles physics, material science, bio-chemistry, etc. KEK has large scale accelerators used by many users across the world. EMI-1 was deployed as a part of the Central Computer System there and mostly used by researchers in particle physics, especially, Belle/Belle II and International Linear Collider (ILC). Belle is the experiment exploring CP-violation that has already completed data acquisition. However, the data analysis is ongoing and still need large scale computing resources. Now the KEK B-Factory is being upgraded, more than 50 times more data is expected at Belle II. Belle II is utilizing the Grid computing infrastructure mainly composed of EMI for designing their detector and preparing the data analysis. While Belle II is an ongoing project, the Japanese HEP society has been willing to host the ILC in Japan. The computing resources used by ILC to design their detector were accessed through the EMI environment. Their Technical Design Report in 2012 consumed a lot of computing resources.

The Fig. 1 shows monthly CPU consumption normalized by HEPSPEC (in HEPSPEC x hours) in PY4. Several MC production campaigns both in Belle II and ILC massively contribute CPU utilization in the Central Computer System at KEK.

Figure 1: KEK CPU Usage during PY4

It can be seen that the EMI environment was used a lot for research in Belle (including Belle II) and ILC.

For StoRM as a storage management system, we have observed more than 0.5 PB of writing and 5 PB of reading during PY4.

Currently, Belle II is planning to start its data acquisition in the end of 2016. Towards the commissioning of Belle II, it is expect that the EMI environment will be more heavily used in the coming years. Belle II has chosen EMI as their Distributed Computing Infrastructure and the support by EGI is necessary to operate the environment. The future of EMI and EGI is therefore critical to KEK.

# Korea Institute of Science and Technology Information (KISTI)

## Activity Summary

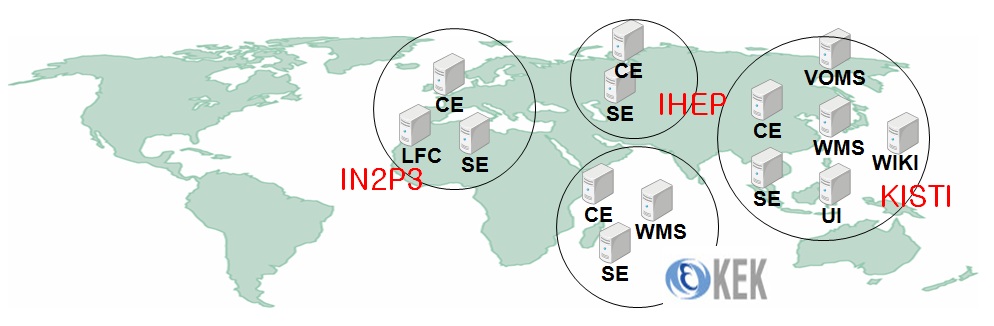
### WP4 – SA1 Operations (Total PM: 24)

During PY4, the KISTI ALICE Tier2 operation has been merged into part of the operation of KISTI ALICE Tier1 candidate, which was initially set up in July 2010 and has been managed by the KISTI GSDC center. A couple of fundamental requirements have yet to be met to become qualified as an official T1 for the ALICE experiment, including 10Gbps direct network connection between KISTI and CERN and 24-hour on-call support. Table 1 shows the resources that KISTI has pledged to provide as a T1 candidate from 2012 to 2014. In 2013, KISTI has managed to fulfil the CPU pledge of 25,000 HS06 with about 2,000 CPU cores and the Disk pledge with 1000 TB of DISK deployed. A total of 1040 TB of Tape Storage has been deployed by 2013. KISTI is pushing hard to expand the CPU and Tape resources to meet the 2014 pledged resource requirement of ~31,000 HS06 with ~2,500 cores and 2 PB of Tape in 2014.

|  |  |  |  |
| --- | --- | --- | --- |
|  | 2012 | 2013 | 2014 |
| CPU(HS06) | 18,800 | 25,000 | 31,250 |
| Disk(TB) | 1,000 | 1,000 | 1,000 |
| Tape(TB) | 1,000 | 1,500 | 2,000 |

< Table 1. Pledged Resources for KISTI ALICE T1 Candidate >

In continuation of the previous year’s operation of France-Asia VO Grid infrastructure (Figure 1), KISTI has continued its operation in collaboration with CC-IN2P3 in France during PY3 as well. It is expected to utilize the France-Asia VO more seriously in 2014 to fully exploit its gird resources to help enable the development of new grid applications such as a large-scale drug repositioning problem, which has been solicited for help from some user communities in Korea.



<Figure 1. France-Asia VO Grid Infrastructure>

In addition to the France-Asia VO, KISTI, as part of testing and QA working group, has been working with Geant4 collaboration to set up a Geant4 VO site to provide grid resources (~120 CPU cores) for physics validation for the Geant4 simulation toolkit to be released every 6 months.

# National Science and Technology Development Agency (NSTDA)

## Activity Summary

### WP2 – NA2 External Relations (Total PM: 0.2)

During the 4th year project period, NECTEC/NSTDA continues participating in both international and local events. The detailed activities are listed as follows:

* International activities:

WLCG MOU signed on October 10, 2013

NSTDA ALICE Tier2 : in production since April 2012

SUT ALICE Tier2 : still under configuration and testing

NSTDA-CU CMS Tier2: still under configuration and testing

Attending ALICE Physics analysis and Tier-1/2 Workshop in 3-7 March 2014

* Local Activities:
  + Local Exhibitions:
    - PRAGMA 24, 21-22 March 2013, Bangkok, Thailand
    - 8th Siam Physic Congress, 22-23 March 2013, Chiangmai, Thailand
    - 17th International ANnual Symposium on Computational Science and Engineering, 27-29 March 2013, Khonkaen, Thailand
    - NSTDA Annual Conference 2013, 30 March – 3 April 2013, Thailand Science Park, Pathumthani
    - eHPC 2013 and JCSSE 2013, 29 - 31 May 2013, Khonkaen
    - 7th Conference of the Asian Consortium on Computational Material Science, 24 – 27 July 2013, Nakhon Ratchasima, Thailand
  + User Trainings:
    - Electronic Structure Calculation for Molecular System using Gaussian 09 and Electronic Structure Calculation for Bulk Material using ABIBIT @ Khonkaen University, Khonkaen
    - Workshop on Computer-aided Molecular Design, 9-10 May 2013@ Chulalongkorn University, Bangkok
    - gWRF workshop in Thailand 2013 @ HAII, Bangkok
    - CUAHSI: Hydrologic Information System @NECTEC, Pathumthani
  + Workshop and PR:
    - Promote to Naresuan University @ Suranaree University of Technology, 15 March 2013
    - Workshop on Computer-aided Molecular Design@ Chulalongkorn University, Bangkok , 9-10 May 2013
    - eHPC2013 @ Khonkaen, 31 May 2013
    - INET Bangkok Conference @ Queen Sirikit National Convention Center, Bangkok, 8 June 2013
    - Faculty of Computer Engineering, School of Engineering, KMUTT, @ NECTEC, 2 May 2013
    - Faculty of Science, Thummasart University @ NECTEC, 12 July 2013
    - Faculty of Science @ Mae Fah Luang University, 21 June 2012
    - School of Science and Information Technology @ Walailak University, Nakhon Sri Thammarat, 18 July 2013
* [http://www.e-science.in.th](http://www.e-science.in.th/)

### WP3 – NA3 User Community Coordination (Total PM: 17.7)

During the 4th year participating in EGI-InSPIRE, key actions of NECTEC/NSTDA are running its parts in the “Thailand National e-Science Infrastructure Consortium” project. The project description and progress has been presented annually in ISGC “E-Science activities in Asia Pacific” session since 2011.

Achievements in 2013:

* Three VOs have been approved by the Steering Committee, with research plans. These are
  + Computational Science and Engineering, led by S. Vannarat, NECTEC/NSTDA
  + High Energy Particle Physics, led by B. Asavapibhop, CU
  + Computer Science and Engineering, led by T. Achalakul, KMUTT
* Resources and Services
  + Total computing cores: 1,488 ( 360 cores were reported in ISGC 2013)
  + Total storage: 350TB (350 TB were reported in ISGC 2013)
  + FY 2013 resource utilization: 4.1 million CPU-hr (1 OCT 2012 - 30 SEP 2013)
  + FY 2012 resource utilization: 2.5 million CPU-hr (1 OCT 2011 - 30 SEP 2012)
  + FY 2011 resource utilization: 1.3 million CPU-hr (1 OCT 2010 - 30 SEP 2011)
* Current active project (as of SEP 2013)
  + Computational Science and Engineering VO: 32 projects
  + High Energy Particle Physics VO: 1 project
  + Computer Science and Engineering VO: 4 projects
* NECTEC GOC CA services ( member of APGrid-PMA)

# *National University of Singapore (NUS)*

## Activity Summary

In the effort to stimulate the interest and usage of computational tools for Singapore, we are launching a National Supercomputing Centre (NSCC) above any national grid or cloud infrastructure. This multimillion dollar initiative (a grant of tens of millions of Euros in the process of approval) will aim towards provisioning for up to 1 PetaFLOP of computational power for various stakeholders in Singapore from Research Institutes to Universities to adopt computational thinking in their respective fields and to translated computational techniques and apply it to their own domain of expertise.

The participation in EGI has benefited us in this heightened awareness of the importance of computing infrastructure to support a higher level of computational competence. As grid and now cloud computing expertise is now mainstream in Singapore with mega-data centres being set up in Singapore with an estimated 50% of data centre business in Southeast Asia based in Singapore, many institutions are migrating to cloud services. In this 4th year of EGI-InSPIRE, the National University of Singapore is now party to and committed to more than several million dollar funds to participate in the NSCC. Our university Grid will be integrated into the new national research and education network SINGAREN into a cloud and now, an integrated supercomputing network.

### WP4 – SA1 Operations (Total PM: )

Grid has given way to cloud and we have implemented Cloud provisioning for student teaching in NUS as well as departmental cloud support for Research Data Management Policy compliance. Secure infrastructure is handled by Computer Centre NUS and the BIC IT team attached to LSI.

### WP2 – NA2 External Relations (Total PM: )

Many meetings have been conducted over the year, including presentations and representation to government. Publicity amongst students have resulted increased awareness in our HPC academy and our students from NUS and NTU have been selected for taking part in ASC'14 supercomputing application competition. NUS team participating for the first time, was ranked 17th in the midst of strong global competitors.Regular meetings have been set up for our NUS Supercomputing Task force to promote this effort. Potential Industry partners such as large corporations such as Syngenta (Crop Genomics) and Keppel (off shore marine and deep sea mining)  and SME such as KOOPrime (genome informatics) have been engaged to line them up for provision of services to the private sector.

Going forward, we anticipate at least SGD 98 million for the national supercomputing centre from the government of which NUS is participating with contribution of  SGD 6.4 million for the next three years. Awareness promotion and capacity building has been successful and still ongoing as there is a strong base of non-users. Good interactions with industry is also very promising. Overall, we have very satisfactory progress.

# University of Melbourne (UNIMELB)

## Activity Summary

The CoEPP Research Computing team had another successful year of delivering reliable computing resources to the Worldwide LHC Computing Grid (WLCG) in 2013. The Australian-ATLAS Tier 2 grid site delivered on 99% of our computation pledge to the ATLAS experiment with 98.6% reliability and 97.6 availability rating, as well as providing 800 terabytes of grid storage.

During the LHC's Long Shutdown 1 it has been important for the grid computing infrastructure to not only remain fully operational but to grow in capacity to meet the physic programs, these include large scale Monte Carlo simulated event generation, raw data reprocessing and physics researcher analysis jobs. The Australian-ATLAS Tier 2 grid site was expanded proportionally to the requirements of the ATLAS experiment.

CoEPP's local computing resources for use by Australian CoEPP physicists were also significantly enhanced during 2013, primarily through the deployment of virtual resources in the Australian Nectar Research Cloud and on the Research Data Storage Infrastructure (RDSI).

### WP2 – NA2 External Relations (Total PM: 4)

Two presentations were made at CHEP2013 in Amsterdam; “Implementation of a GRID Tier-2 and general purpose computing clusters with Open Stack Cloud” and “Dynamic TORQUE VM provisioning in a cloud environment”. A technical overview of our storage infrastructure was given at the Edinburgh DPM Workshop entitled “Australia Site Report” and the Belle II Computing/Software workshop meeting was presented a talk on our “Federated Xrootd”.

### WP4 – SA1 Operations (Total PM: 68)

The Australian-ATLAS grid site saw two major hardware expansions in 2013. Our compute capability grew by 1000 HEPSPECs with the addition of 8 new Dell PowerEdge R620 multicore servers and our storage capacity expanded by 80 terabytes to 840 terabytes of grid connected storage.

Two major grid software upgrades were also performed in 2013 to ensure maximum performance, system security and grid compatibility. Firstly the middleware software stack which underpins all grid operations was migrated from gLite to the European Middleware Initiative 2.0 (EMI2) and secondly all cluster nodes and infrastructure nodes were upgraded from Scientific Linux 5.8 to Scientific Linux 6.4.

All the hardware and software upgrades during 2013 were achieved with minimal service interruption as our reported performance figures above show and this allowed us to complete over 2,600,000 grid jobs during the calendar year.

The Cloud team contributed to seamlessly integrate national research cloud resources based on OpenStack into CoEPP's infrastructures with minimal modification to existing system works. 400 extra CPU cores were initially added to CoEPP Tier 2 and Tier 3 resources in 2013. Both the Tier 2 grid infrastructure and Tier 3 local computing cluster are now able to automatically allocate and manage dynamic resources on the cloud on-demand. The cloud system is in fully functioning production and has been widely used by CoEPP theorists and experimentalists to run simulation and analysis jobs. Over 200,000 ATLAS Monte Carlo production jobs were completed on cloud over 2013. In August 2013 the Tier 3 system was augmented with cloud resources, leading to a 400 per cent improvement in system use.

# Universiti Putra Malaysia (UPM)

## Activity Summary

The past year has been a rather tremendous year for Malaysia making good progress of the Academic Grid Malaysia Project which started with the involvement of Universiti Putra Malaysia in two previous EU FP-7 project namely EUAsiaGrid and the present EGI-Inspire. Although the lead institution is Universiti Putra Malaysia (UPM), Academic Grid Malaysia is supported by the Ministry of Science, Technology and Innovation (MOSTI) in terms of funding the activities as carried out by the National Grid Computing Initiative (NGCI) Secretariat based at Universiti Tenaga National (UNITEN) (National Power University). The following are the activity summary of what has been done in the past 12 months.

### WP2 – NA2 External Relations (4PM)

Community engagement was again constitute a major part of the activities and generally the awareness among researchers and stakeholders is much better particularly on the impact and role of EGI-Inspire community in the development of grid computing in Malaysia. Academic Grid Malaysia is fully committed to make EGI model as the de facto model in which all grid infrastructure providers from various higher learning as well as research institutions should follow. All trainings and engagements that has been carried out and also planned in the future will be based on the EGI model. Furtherance to that, Malaysia is naturally committed to be part of the future EU's federated cloud initiative and is ready to take part in any future workpackages. Below are the list of engagements in the form of trainings, symposium and visits that has been carried out successfully by Academic Grid Malaysia.

|  |  |  |  |
| --- | --- | --- | --- |
|  | Engagement | Venue | Date |
| 1 | Grid User Training | Universiti Tenaga National | 11-13 Mar, 2013 |
| 2 | Grid System Administrator Training | Nuclear Malaysia | 22-25 Apr, 2013 |
| 3 | Grid User Training | Universiti Putra Malaysia | 1-2 July, 2013 |
| 4 | Grid System Administrator Training | Universiti Sains Malaysia | 3-5 Mar, 2014 |
| 5 | Grid System Administrator Training | Universiti Malaysia Sabah | 12-14 Mar, 2014 |
| 6 | Grid Cloud Identity Summit 3-4 July 2013 | Universiti Putra Malaysia | 3-4 Jul, 2013 |
| 7 | Technical visit to universities in Singapore to learn and exchange ideas | Nanyang Technical University and National University of Singapore | 10-11 Feb, 2014 |
| 8 | Visits to universities at Eastern State of Terengganu to explain about Academic Grid Malaysia and EGI | Universiti Malaysia Terengganu and Universiti Sultan Zainal Abidin | 24-25 Fe, 2014 |
|  |  |  |  |

One important development in Malaysia in the year 2013 was the establishment of National Centre for Particle Physics (NCPP) by Malaysia Science Academy, Misistry of Science, Technology and Innovation (MOSTI) in collaboration with University of Malaya. The establishment of NCPP is much welcomed as based from other partner countries, particle physics community will be a major driving force behind grid initiative. Academic Grid Malaysia was involved since its inception and continue to do so until today; assisting in the development of their compute and network requirement with a view of establishing Complex Muon Solenoid (CMS) Tier 2 Site in Malaysia. Malaysia has sent several particle physics scientists and researchers to be attached at CERN to acquire necessary knowledge and technical knowhow. Reciprocally, CERN scientists as well as other top-level officials have visited Malaysia and gave seminars in the effort to strengthen the collaboration. Presently, a substantial infrastructure (compute and storage) has been procured and installed ready to undergo the process of EGI certified site development and certification by Academic Grid Malaysia.

### WP4 – SA1 Operations (2PM)

As has been highlighted in the community engagement, several grid user and administrator training have been carried out in the context of Academic Grid Malaysia providing supports to users/potential users in various discipline from structural biology, to engineering. Apart from supporting existing EGI certified sites with their periodical maintenance and trouble-shooting issues, Academic Grid Malaysia also has a two-pronged objectives during the training whereby at the end of the training there will be a cluster being certified. This year, a cluster at Universiti Sains Malaysia has just been EGI certified by Academia Sinica Grid Computing and additional 144 cores after the training increasing the total number of cores from 616 to 760 cores. Another training was done at Universiti Malaysia Sabah and at the present moment the site is still undergoing network setting and once done there will be additional compute power of about 128 cores. Perhaps the biggest new initiative for Malaysia is on the development of CMS Tier-2 Site at University of Malaysia and currently a total of 704 cores are being installed and tested to make ready for the configuration towards an EGI certified site which once the certification is complete Academic Grid Malaysia will have the potential compute power of over 1500 physical cores.

Malaysia also runs an IGTF approved National Certification Authority (CA) under the organization called Malaysian Identity Federation and Access Management (MyIFAM) which manages application and issuance of User Certificates, Host Certificates and Service certificates to people and sites participating in grid computing. MyIFAM has been extra busy for the past 12 months in providing the technical and administrative supports for users as well as researchers and grid developers on certificate-related issues. MyIFAM is also actively involved in Federated Identity initiative and carrying out research and development on Level of Assurance for the community and having to do the balancing act between lower versus higher levels of assurance and ease of use. This is under a service called Secure Identity Federation on Unified Lightweigt Access maNagement (SIFULAN) ([www.sifulan.my](http://www.sifulan.my/)) which aspires to become ASEAN catch-all federation. A workshop called TEIN Identity Management and Federation Workshop was successfully organised on 18-19 of January, 2014 at Institut teknologi Bandung, Indonesia where nearly all ASEAN countries participated. TransEurasian Information Network (TEIN) is also an European Union project.