Updates on Grid and Cloud Initiatives in the Philippines

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About ASTI

R&D agency of the Philippine Government working on ICT and Microelectronics

Operates and Manages the National Research Network and National Grid Infrastructure
The Philippine e-Science Grid

Philippine e-Science Grid (PSciGrid) Program
Funding: Department of Science and Technology Grant
Duration: 3.5 years (January 2008 – June 2011)

Objectives:

- Establish a national e-Science grid infrastructure in the Philippines that will enable collaborative research among local educational and research institutions.

- Provide seamless access to high-performance computing resources and applications for Life and Physical Sciences
Why Earth Science and Life Science?

Location, Location, Location
Why Physical science and Life science?

- Physical Science
  - Typhoons
  - Earthquakes
  - Volcanoes

- Life Science
  - Megabiodiversity hotspot
2009 and 2010 Pacific Typhoon season

Source: National Hurricane Center NOAA
Active Faults and Tsunami Prone Areas

Source: Philippine Institute of Volcanology and Seismology

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Active Volcanoes of SE Asia
Source: Smithsonian Institution
Philippine Biodiversity

More than 7,000 islands within the hotspot makes the Philippines one of the world’s biologically rich countries.

One of the few nations that is, in its entirety both a hotspot and a megadiversity country.
The Philippine e-Science Grid

Two (2) projects under the Program

- Boosting Grid Computing Using Reconfigurable Hardware Technology
- Boosting Social and Technological Capabilities for Bioinformatics Research
ASTI’s HPC Facility

**Computing (408 cores)**
- 51 computing nodes (2 x 2.0 GHz Intel Xeon)
- 300GB/500 GB of disk space and 16GB/24GB of RAM per node
- 8 FPGA - based hardware accelerators

**Storage (30 TB)**
- 6TB for raw data
- 4TB for DNA and protein sequences
- 4TB for software mirror
- Additional 16TB (usable 12TB)

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Six Computing Clusters

- The Bioinformatics Cluster (8 nodes)
- The Meteorology Cluster (6 nodes)
- The Cluster Sandbox (2 nodes)
- The EUAsiaGrid and EGEE Collaboration Cluster (EGEE certified production cluster) (7 nodes)
- Virtual Cluster 1 (16 nodes)
- Virtual Cluster 2 (13 nodes)
Middleware and Applications

Cluster Operating System: **ROCKS 5.2.2**
Grid Middleware: **gLite**

**Installed Applications**
- Bioinformatics (BioRoll, Progeniq BioBoost, AutoDock)
- Seismology (SPECFEM3D)
- Meteorology (WRF, RegCM, MM5)
- Oceanography (SeaDAS)
Bioinformatics Applications

Bio Roll

- Biopython
- Phylip
- Mr. Bayes
- ClustalW
- Fasta
- NCBI BLAST
- T_Coffee
- Glimmer
- MpiBLAST
- Emboss

Progeniq Bioboost

SmithWaterman

ClustalW

HMMer
Other Bio resources

- Biomirror
- S-Star Archive
- 3D Visualization facility
Welcome to the PSciGrid Portal

The Philippine e-Science Grid Portal combines portals developed by the Grids team of Research & Development Division in Advanced Science & Technology Institute – Department of Science & Technology, and tools and portals from the Open Grid Computing Environments Portal. Grid access and high-level programming APIs are provided by a portal-compatible version of the Java COG kit.

PSciGrid Portals

- GridPort Job Submission Portal: The GridPort Job Submission Portal allows users to submit batch jobs to remote resources via the Resource Allocation Manager. It currently supports pre-allocated GRAM versions 2.4, 2.2.1, and 2.1. The portal allows a user to specify job parameters, submit the job, and view job status information. The portal requires a working GRAM server or Globus gatekeeper running on port 2019 on the remote resources with which the user will interact.

- GridShakers Portal: The GridShakers portal allows biologists to view and downloadlife sequences in GenBank and FASTA formats. It is connected to a MySQL database with the BestSQL schema and uses Hibernate and Blueprint to query the database and display the results.

- Proxy Manager Portal: The Proxy Manager portal interacts with MyProxy servers to retrieve your proxy credentials to make them available to other components in the portal. The ProxyManager will support multiple credentials, allowing you to switch between community and user credentials, or to alternate between credentials for different grids.

- File Manager Portal: The File Manager portal allows the user to upload data files and submit to the storage elements for processing and executing the job.

- Condor Job Submission Portal: The Condor Job Submission portal is written with Java Server Faces and is converted into a portal using the Apache JSP portal bridge. The portal uses Condor to submit batch jobs to remote resources on your behalf using the Condor Server Manager. This is the machine that runs the Collector and Scheduler daemons which, in our case, the frontend. Benhady and Uros clusters have the Condor package installed but we will use the former since it has more computing power.

- Torque Job Submission Portal: The Torque/OpenPBS Job Submission portal allows users to submit custom batch jobs or predefined bioinformatics tools to the baysway cluster.

- Administration: The administration portal enables the administrative root user to manage the portal for all users. Please see the Gridsphere documentation for more information about administering the portal.

Welcome: The welcome portal enables a user to edit their personal settings, logout, freezeout, group membership, and password. This part of the portal is not specific to grid or gridkit functionality.

Current documentation for the portal is located on the PSciGrid wiki site.

Announcements and News:
DGCE NEWS Blog
Admin Feed

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Trainings

SPECFEM 3D (August 2010)
  In-depth usage of SPECFEM 3D in collaboration with ASGC


PsciGrid Launching (July 2010)

Training on UPLB Biotech Data Warehouse Portal (Feb 2011)

Philippine Genome Center (Feb 2011)
  One-day talk on ASTI initiatives on bio-informatics
  Demos on available bio-informatics tools on the Banyuhay cluster
International Linkages

Contributing Member, EUAsiaGrid

Institutional Member, Pacific Rim and Grid Middleware Assembly
Collaborations

Current Users
- UP Marine Science Institute
- UPLB Biotech
- International Rice Research Institute
- PAGASA (Weather Bureau)
- UP National Institute of Physics
- UP Computer Science Department
- PHIVOLCS (Volcanology and Seismology)

Future Users
- Manila Observatory (Weather/Climate research)
- Philippine Genome Center
- Energy Development Corporation
PSciGrid Website

Welcome to Philippine e-Science Grid

ASTI now connected to the grid!

Written by Administrator
Tuesday, 27 October 2008 07:14

ASTI has joined the list of its global grid community now that the HPC is connected to the grid. EUAsiaGrid has certified the ASTI HPC as a production site. The connection to EUAsiaGrid finally allows ASTI HPC to participate in sharing of its computing resources with the grid users in Asia. It has deployed 1 computing cluster with 7 computing nodes that amount to 44 cores and 2 terabytes of storage space as working nodes that will be compounded with EUAsiaGrid’s pool of virtual computing resources and storage space.

Last Updated on Monday, 16 November 2009 10:24

Read more... >>

ASTI HPC Facility now up and running

Written by Administrator
Thursday, 08 October 2009 06:12

The ASTI High-Performance Computing (HPC) facility is now fully operational. The facility was setup through the Philippine e-Science Grid (PSCGrid) Program, which is DOST and ASTI’s initiative to capitalize on ICT and advanced network technologies to help the local scientific and research community to upgrade the quality of research outputs, improve the access of local researchers and scientists to the latest up-to-date scientific data.

www.pscigrid.gov.ph
Current and Future Works

- Develop other FPGA applications
- Expand Virtualization
- Procurement of blade servers
- Integrate PsciGrid with Philippine Government Data Center
- IPv6-enabled Clusters
- Propose Phase 2 Program
- Continue to advocate and promote grid technology to local universities and research communities
Thank You