

GCP HPC's Going Global

A sustainable future for the GCP cluster/grid HPC facilities



Goal of the GCP SP4 HPC project in 2008

Explore sustainable future options

Current status of the HPC facilities is

- 3 primary HPC cluster sites at CIP, ICRISAT & IIRRI started with a total of 16 dual CPU nodes (32 x 64-bit processors), now 4 years old with only minor interim expansion
- Moderate cost workstations can now provide dual quad-core CPUs, the equivalent of 8 x 64-bit processors!
- GCP not anticipated to fund replacement systems
- On site HPCs have enabled centers to build up advanced Bioinformatics competencies, that are continuing to grow
- GCP processing resources have been used both locally and shared online, but due to limited technical support and telecommunications resources, have not achieved 24 x 7 global cluster/grid availability
- Approaching 2009, there are now HPC processing options which were not available when this project was planned
- The ongoing goal of providing advanced Bioinformatics support for the GCP SP1, 2 and 3 programs using HPC facilities does not oblige centers to "own" HPCs

Alternative HPC processing scenarios

- Contracting HPC online bureau resources as a service
- Exploiting a massive network (real local or virtual cloud) of standard desktop PCs.
- Buying replacement HPCs, now offering much higher cost/benefit, but without GCP funding (!?!)
- Connecting up with powerful collaborator's cluster/grid(s)

The aging HPC sites still provide a useful base to maintain advanced Bioinformatics competencies for the GCP, working within the standards oriented Bioinformatics open source community, so the fourth option (above) offers a future following along a steady evolutionary path.

The E-science grid facility for Europe and Latin America (EELA) is supporting CIP to join a much more powerful Grid, with corresponding partners in Asia for ICRISAT and IIRRI. CIP is now building a cluster to test compatibility with existing GCP programs, including Rmpi and Structure

Poster 4.5

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E-science grid facility for Europe and Latin America

EELA-2
WWW.EELA-2.EU

European Commission Project - Research Infrastructures
INFRA 2007-1.2.3: e-Science Grid Infrastructures
Grant agreement N°: 223797 - FP7 funding: 2003 K€ - Co-financing of partners of 2.44 M€
Start date: 1 April 2008 - End date: 31 March 2010

The EELA-2 Project aims at building on the current EELA infrastructure, a high capacity, production-quality, scalable Grid Facility providing round-the-clock, worldwide access to distributed computing, storage and network resources for a wide spectrum of Applications from European and Latin American scientific communities. The project will specifically focus on two goals:

- Provide an empowered Grid Facility with versatile services fulfilling the needs of Applications;
- Ensure the long-term sustainability of the e-infrastructure beyond the term of the project.

Scope of Application:
The project includes applications that currently have well-established research links, thereby promoting the likelihood that the Grid will enhance performances. These are Biomedical, High Energy Physics, Climate and e-Learning. Besides these applications already supported by EELA, new ones (e-Industry and e-Government) will be supported in EELA-2.

Project Organization:
The EELA-2 project is organized in six activities:

SA1: Administrative and technical management of the Project:
In charge of taking timely and proper decisions and actions to guarantee the success of the project, the sustainability of the e-infrastructure after the end of EELA-2 and establishing liaisons with related projects.

SA2: Dissemination and training:
This activity will disseminate information about the project through various means including websites, press releases, brochures, etc. It will also provide different training tutorials for users, administrators, developers, and customized ones for specific applications.

SA3: e-Infrastructure:
SA3 will create, operate, maintain, support and manage a production quality Grid empowered infrastructure, to make computing and storage resources from partners in Latin American and Europe accessible to the EELA-2 e-Science communities, and fostering the creation of basic organizational structures, protocols and procedures required for a long-term operation of an European-Latin American interoperative infrastructure.

SA4: e-Infrastructure:
SA4 will create, operate, maintain, support and manage a production quality Grid empowered infrastructure, to make computing and storage resources from partners in Latin American and Europe accessible to the EELA-2 e-Science communities, and fostering the creation of basic organizational structures, protocols and procedures required for a long-term operation of an European-Latin American interoperative infrastructure.

SA5: e-Infrastructure:
The objective of the SA2 activity is to play a central role in the following: network related activities; network engineering and operations support integrated with the EELA-2 Operations Centre (OC); management of the relations between EELA-2, CLARA, CEAN and IREN; the International Research and Education Networks in Latin America and Europe; strengthening the link between the "Grid" and the "Networked" communities; and automation, to the extent possible, of the processes for network service provisioning for EELA-2.

SA6: Development of Services for Applications and Interoperability:
SA6 will focus on extending the versatility of the production service managed by SA3 and functionalities as required. Research and development activities will be conducted to increase the reach and the usability of e-infrastructure by assimilating engineering existing technologies and developing new ones that will facilitate the installation, management and use of the grid infrastructure. Special attention will be given to the issues related with the sustainable use, management and growth of the e-infrastructure and its users' community.

E-science grid facility for Europe and Latin America

EELA-2 Consortium
The EELA-2 Consortium is composed of 16 partners (6 from Europe, 9 from LA and 1 International institution), from 14 countries (5 from Europe, 9 from LA) corresponding to 53 institutions, most of them clustered in 9 national Joint Research Units (JRU) gathering all Grid efforts in Latin America and Europe. Should a new institution apply to become customer of EELA-2, two possibilities will be opened, namely:

- Collaborating with EELA-2 through a Memorandum of Understanding, or
- Becoming a Member of the EELA-2 Consortium after negotiation with the Technical and Management Boards and endorsement by the Consortium Board. New members will be asked to channel their application through their local JRU if there is one in the country.

member institutions

JRU ARGENTINA (Coordinating institution INF-UNLP)
INF-UNLP Instituto de Física - Universidad Nacional de La Plata
INF-UNLP Laboratorio de Investigación en Nuevas Tecnologías Informáticas - Universidad Nacional de La Plata
UBA Universidad de Buenos Aires

JRU BRAZIL (Coordinating institution UFPA)
CITEC Centro Federal de Educação Tecnológica
FONCTEL Fundação Oswaldo Cruz
Instituto Militar de Engenharia
INCCOR Instituto do Coração
LNCC Laboratório Nacional de Computação Científica
ON Observatório Nacional
RNP Rede Nacional de Pesquisas
SPACE São Paulo Regional Analysis Centre
UFPA Universidade Federal do Pará
UFV Universidade Federal de Viçosa
UFPA Universidade Federal do Rio de Janeiro
UNB Universidade de Brasília
UNICAMP Universidade Estadual de Campinas
UNICELAR Universidade Mackenzie

JRU CHILE (Coordinating institution REUNA)
CEAZA Centro de Estudios Avanzados en Zonas Áridas
UNAHUE Universidad de La Frontera
REUNA Red Universitaria Nacional
UECE Universidad de Concepción
UFRO Universidad de la Frontera
UTEM Universidad Técnica Federico Santa María
UNAPARASO Universidad de Valparaíso

INTERNACIONAL (Single Member)
CLARA Cooperación Latino Americana de Redes Avanzadas e IREN

JRU COLOMBIA (Coordinating institution UNIANDES)
US Universidad Industrial de Santander
UNIANDES Universidad de los Andes

CUBA (Single Member)
CUBAENERGIA

ECUADOR (Single Member)
UPIF Universidad Técnica Particular de Loja

JRU FRANCE (Coordinating institution CNRS)
CNRS Institut National de Physique Nucléaire et de Physique des Particules
IPGP Institut de Physique du Globe de Paris

FRANCE (Single Member)
H2P Développement S.A.

IRELAND (Single Member)
UCCC-CCRC National University of Ireland Cork - Coastal and Marine Resource Centre

ITALY (Single Member)
INFN Istituto Nazionale di Fisica Nucleare

MEXICO (Single Member)
UNAM Universidad Nacional de México
CIP Centro Internacional de la Papa
PUCP Pontificia Universidad Católica de Perú
SENAMET Servicio Nacional de Meteorología e Hidrología del Perú
USAF Universidad San Martín de Porras

JRU PORTUGAL (Coordinating institution UPOKIO)
UAU Universidade de Aveiro
UMinho Universidade do Minho
UPORIO Universidade de Porto

JRU SPAIN (Coordinating institution CENIAI)
CESGA Centro de Super Computación de Galicia
CIBMAI Centro de Investigaciones Energéticas, Medioambientales y Tecnológicas
MA3-G (SME)
RES-ES UC Universidad de Cantabria
UCA Universidad Complutense de Madrid
UNEX Universidad de Extremadura
UPV Universidad Politécnica de Valencia

JRU VENEZUELA (Coordinating institution ULA)
ULA Universidad de Los Andes
USA Universidad Simón Bolívar

EELA-2 Portal: <http://www.eu-eela.eu>
Stay tuned with the next tutorials and workshops: <http://indico.eu-eela.eu>
Get to know the applications supported by the project: <http://applicatons.eu-eela.eu>
Additional information: <http://wiki.eu-eela.eu>