



gisela BULLETIN

Grid Initiatives for e-Science virtual
communities in Europe and Latin America



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A SUSTAINABLE PATH FOR LATIN AMERICA

Today computational methods and data handling have significant influence in scientific research, new technologies lead to new research methods. Scientific research is performed in collaborative processes among scientific teams from different administrative domains, distributed around the world and using digital platforms through the use of e-Infrastructures.

International efforts have built scientific research networks; human networks supported by e-Infrastructures, with a diversity of applications and services required by e-Science communities, promoting the formation of a team of experts through specialized training programs and the development of applications and service in a collaborative way as well as the design of new services.

An important experience building a Grid infrastructure in Latin America, has been going on with the European Commission co-funded projects EELA, EELA-2 and GISELA, which since 2006 have been building a quality production Latin America Grid infrastructure interoperable with the European Grid EGI. The experience gained during the EELA and EELA-2 Projects conducted to GISELA, to be a Resource Grid Infrastructure provider supporting the gLite Grid services and the OurGrid opportunistic computational services offering the Virtual Research Communities support for every kind of application and with a new diversity of advanced services (DIRAC, Security Storage, monitoring, etc.), training, user support, EGI collaboration and other regional initiatives.



JESÚS CRUZ
UNAM

Nevertheless in LA Grid knowledge and skills maturity need more improvements, and is still far from being in a stage to grant self-sustainability of Grid Services. To maintain advanced computing service in the region an Advanced Computing Services Business Plan, where Grid infrastructure and services are included, has been proposed in GISELA, but because the different maturity levels in LA in Grid skills, it is necessary to raise the awareness of Science & Technology Authorities for a plan of support. The GISELA-CHAIN conference to be organized in Mexico City from June 27 to 29 is a wonderful opportunity to promote regional plans to disseminate Grid service and plans to identify and develop advance computing service between the academic and research communities, and stress the development of collaborative projects within the different academic / research institutions and NREN's that participate in the deployment of e-Science in LA to provide human and financial resources for the long term sustainability of advanced computing services.

SCIENCE GATEWAY: A PROPOSAL TO MANAGE COMPUTATIONAL RESOURCES

Faced with the challenge of facilitating the use of the Grid platform, the project **GISELA** adopted the Science Gateway as an interface promising simple, fast and transparent steps.

The **GISELA Science Gateway** (GSG) hides behind a set of complex activities that are presented in a more easy and straightforward way when using computational resources. The main idea is that users can authenticate, run specialized applications, store and preserve large amounts of data, display results and, most importantly, group themselves in communities according to their interest; all this, just by making a click from the same environment.

➔ Applications integrated in the GISELA Science Gateway

The **GISELA Science Gateway** in the first test phase comprises about a dozen of applications related to different knowledge fields: bioinformatics, mathematics, statistics, cultural heritage and industrial processes. These applications are available for researchers in the region to be tested.

* Bioinformatics:

- **ClustalW**: tool for aligning multiple protein or nucleotide sequences.
- **GATE**: simulation tool for medical images (tomographies).
- **Phylogenetics (MrBayes)**: software for Bayesian estimation of phylogeny.

* Mathematics and statistics:

- **Octave**: a tool used for numerical calculations.
- **R**: a free software environment for statistical computing and graphics.

* Cultural Heritage

- **ASTRA**: a tool that enables the reconstruction of sounds or timbres of old instruments, already disappeared, from archaeological data as fragments from excavations, written descriptions, images, among others.

* Industrial process:

- **Industry@GRID**: computational implementation to predicts industrial production scenarios.

Now it is easier to use distributed computing resources

GISELA Science Gateway:
Grid in one click



✓ Easy to use

✓ Simpler

✓ Immediate authentication

✓ Tailored to your community

Latin American researchers interested in using the [GISELA Science Gateway](#) environment can submit their applications by filling out the [survey](#) to identify needs and tools.

Steps for using the GISELA Science Gateway



The first tests in Latin America

The first version of the [GISELA Science Gateway](#) (GSG) is available, environment under which researchers from Latin America may send their jobs to the [GISELA](#) e-Infrastructure in a easy way through a simple web interface and without personal digital certificates. With just one click, researchers can register for a personal account. The GSG is in the integration phase of the applications available in the various fields of knowledge.

With the idea of creating a Latin America task force to meet the technical requirements for connecting under the Science Gateway environment different systems, programs or networks and adapt it to the needs of direct access to different regional advanced computing services, training sessions have been initiated for students and researchers in Latin American interested in becoming familiar with the Science Gateway environment.

The sessions, which began in February, have brought together more than twenty people interested in integrating specific applications and to know the platform on which the [GISELA Science Gateway](#) is mounted, an environment that aims to develop mechanisms to simplify end users access to e -infrastructures.

According Diego Scardacci, a member of the National Institute of Nuclear Physics and coordinator of the tasks to develop the first version of the [GISELA Science Gateway](#), this platform has so far over 100 users that begun testing the first applications integrated.



Scardacci: the GSG already has over 100 users

➔ Environment 2.0 to access advanced computing resources?

[GISELA](#) prepared a special issue on emerging global trends to make easier the environment for researchers who want to share distributed resources.

Has the time come that users can authenticate, perform specialized applications, store and preserve

large amounts of data, display results, all with just one click? These are questions that this journalistic work tries to explained, in which a regional model that proposes an architecture for access to advanced computing services is displayed.

You can read more about this journalistic work here.



GISELA-CHAIN: CONFERENCE



From June 27 to 29 the **GISELA-CHAIN Conference** will be held in Mexico City, an activity open to meet and discuss the scope of the Grid infrastructure in Latin America and the concept of advanced computing based on the strengthening of virtual research communities.

The conference's main objectives are: 1. - Present profile cases of scientific communities that use the e-infrastructure, with particular emphasis on the Science Gateway, and 2. - Discuss policies and plans for long-term sustainability of advanced computing services in Latin America.

➔ ¡Ándele manito!

The Autonomous University of Mexico (UNAM) has the distinction of being the host of this Conference.

As you know, Mexico has been one of the prominent countries of the region in the issue of Grid, where the UNAM has played an important role. The conference is also supported by RedCLARA and Mexico's advanced network, CUDI, one of the most consolidated in the region.



Meanwhile, the alliance with the European project CHAIN to carry out the next conference to be held in Mexico, gives continuity to the joint efforts GISELA and this organization have been doing in training and promoting the Grid e-Infrastructure in the region. The main objective of CHAIN is precisely to coordinate efforts between Europe and the rest of the world in the area of Grid, to ensure coordination and interoperability of the infrastructures in various parts of the world.



UNAM



CUDI



CHAIN



RedCLARA



Conference Topics

- **Experiences of virtual research communities in the use of the e-Infrastructure** (Life Sciences and Bioinformatics, Earth Sciences and Environmental Sciences, Particle Physics and Astrophysics, Humanities and Social Sciences, Management, Industrial & Engineering);

- **Evolution of the e-Infrastructure and sustainability:**

- Conceptualization of advanced computing services.
- The Science Gateway as a universal interface.
- Business models.
- The interoperability.
- The role of regional institutions, national networks and institutions of science and technology.

The organization of the **GISELA-CHAIN Conference** calls for involvement of all those interested in learning about and discussing the latest trends in building and using advanced computing services. Contribution mechanisms, terms and forms of participation can be found [here](#).

Conferences have been organized throughout the period of the projects involved with the Grid platform in Latin America, in cooperation with Europe (EELA EELA2 and GISELA). The **GISELA-CHAIN Conference** is the sixth such meeting, whose common historical objectives are mainly to promote and discuss current trends in technical and organizational aspects proposed for the development and use of Grid infrastructure and, of course, announce the progress of the projects.

* **1st EELA Conference:**
September 2006.
Santiago, Chile.



* **2nd EELA Conference:**
June 2007.
Rio de Janeiro, Brazil
(together with Belief)



* **3rd EELA Conference:**
December 2007.
Catania, Italy.



* **1st EELA-2 Conference:**
February 2009.
Bogota, Colombia.



* **2nd EELA-2 Conference:**
November 2009.
Choroní, Venezuela.



* **GISELA-CHAIN Conference:**
June 2012.
Mexico City, Mexico.



Highlight footage of
the conference (PDF)



ADVANCED COMPUTING FOR LATIN AMERICA: A COOPERATIVE AND SUPPORTIVE MODEL

From November 14 to 16 last year, members of the group responsible for the transition model from GISELA to RedCLARA met in the city of Bucaramanga (Colombia) to define the work plan that would propose the model for Advanced Computing Services (ACS) in Latin America.

The Plan, discussed at length with members of the GISELA project and submitted for evaluation with some officials of the scientific and technological development of the region, aims to offer research communities in Latin America a medium that allows democratic access to various resources from the e-Infrastructure. The Model is based on the collaborative spirit of the National Research and Education Networks - NRENs, by promoting equal opportunities for researchers, regardless of their origin. The Plan was finally adopted by the international reviewers of the GISELA Project and is currently in process of negotiation between different actors in Latin America.

* Advice, support and technology transfer.

- Migration / adaptation / integration "turnkey" of application to e-Infrastructure.
- Consulting and support for the development / adaptation / integration of applications.

* Federated Identity Authentication for services.

* Preservation and data curation.

* Reserve and configuration of computer resources.

- Configuration of virtual resources (processors / storage / network access) to carry out tasks.
- Task Execution in the e-Infrastructure (dedicated or opportunistic).
- Access to remote instruments.



The city of Bucaramanga (Colombia) hosted the meeting to define the Advanced Computing Services Model in the region

➔ Flexible and progressive

The model of advanced computing services is flexible and progressive, according to the needs of each country.

- The computing services are not centered on a particular technology. Grid computing and cloud services are part of the e-Infrastructure.
- The computing services are based on a collaborative proposal.

The service model

The proposed advanced computing services model for Latin America has a cooperative and supportive tone with the following characteristics:

- Computing capacity against demand for research groups in the region.
- Variety of services through one portal (hardware, software, man-ware).
- Promotes the development and implementation of regional solutions (Ourgrid).

The supply of advanced computing services in Latin America will be by way of a Science Gateway, a graphical interface that groups a set of tools, data and complex applications, presenting users with a direct and attractive way to use the resources with a single click.

A regional pathway to present the model

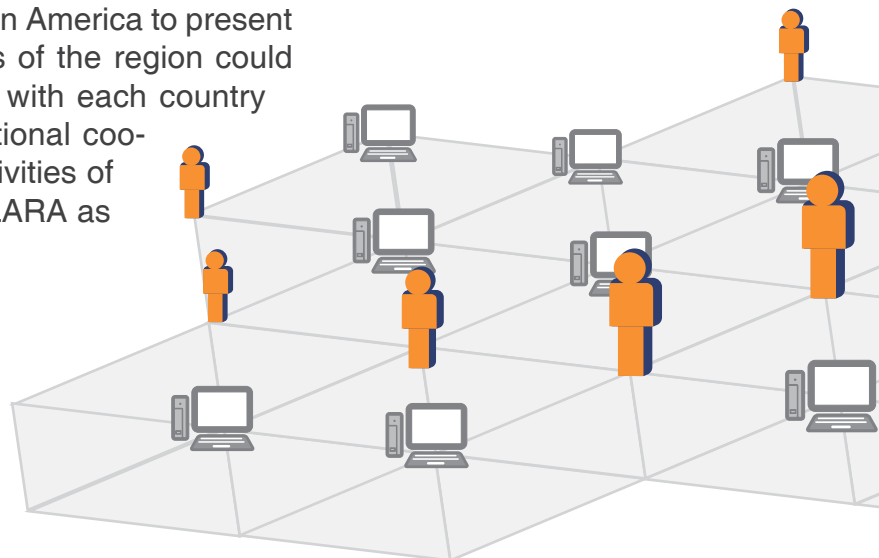
The ACS model takes into account the reality of Latin America in the development of the e-Infrastructure. Since there are different levels and abilities, we propose a flexible model that aims to create opportunities for sustainability.

Only those countries that have the ability to interconnect resources and make available hundreds of CPUs can form a National Grid Initiative (NGI) and have their Grid Operation Center (GOC). Countries that fail to achieve this type of organization will have available a network of Regional of Operation Center (ROC). Gradually, after growth of the national network infrastructure, they will begin to install their own resource centers. Once done, the functions would be transferred to the national networks.

Given this scheme, the current RedCLARA Regional Academic Relations Manager, Luis Nuñez, has initiated a series of visits to organizations of science and technology in Latin America to present the model within which the different countries of the region could be inserted. During the negotiation pathway, with each country we have reviewed the possibilities of international cooperation to develop exchange and training activities of the communities in Latin America, with RedCLARA as main support.

➔ Let's share!

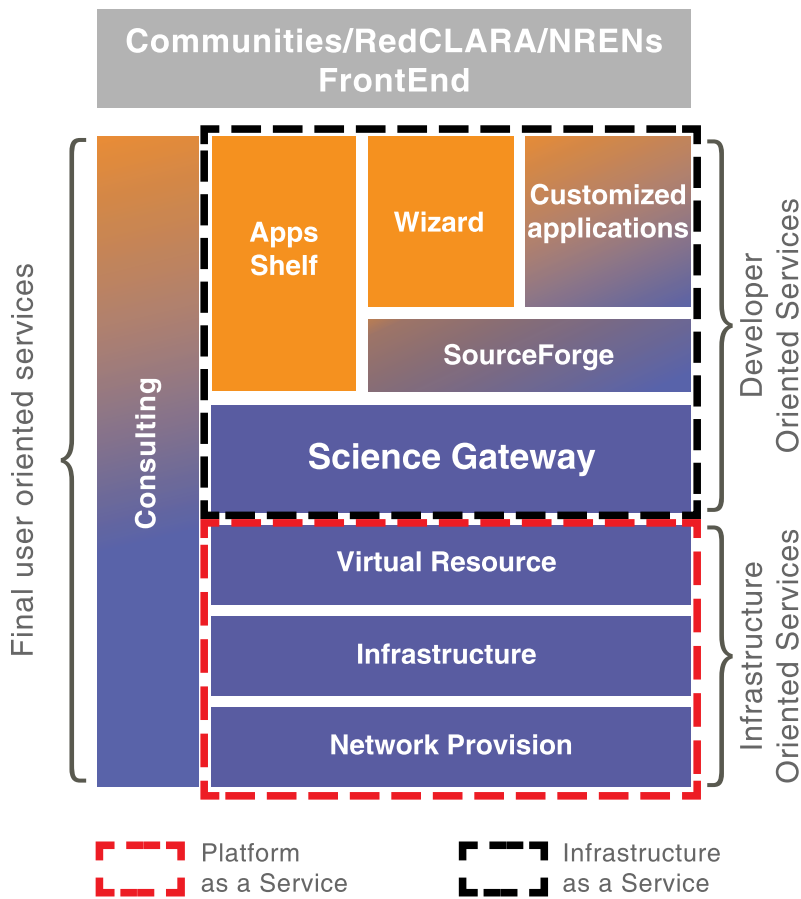
- Share administration and promotion costs at regional level, on a competitive basis.
- Share experience (technical and organizational), generate regional projects and negotiate by volume (a group against technologies suppliers).
- Share ephemeral infrastructure (services concentrated with a 70% of resources destined for national attention).
- Create supportive spaces for regional R & D.
 - Credit Units of Advanced Computing Services.
 - Service Units offered to projects of excellence.
 - Regional geo influence spaces for Advanced Computation.





Negotiating pathway

- Colombia (Colciencias)
- Chile (CONCyT):
- Jamaica (CKLN)
- Costa Rica (CONARE)
- Venezuela (Reacciun)
- Panama (Red CyT)



Advanced Computer Services based on the Science Gateway

Operating the advanced computing model:

- Countries with a GOC.
- Countries without GOC and use a ROC.

Regional Grid

The national GOCs will be responsible for their national services and would interact with the ROC when the services have a regional scope. The ROC will take over the domestic roles of those countries without GOC. RedCLARA would use a minimum staff for the provision of ROC services, since most services will remain under the Resource Centers (RCs) distributed in the different countries. The institutions or the national science and technology organizations, whatever may be the case, would cover the operating costs. RedCLARA would tender the operation of the Regional Network Operations Center (RNOC) every four years, and the National Research and Education Network that provides the higher number of staff to the operation, among other requirements, would operate the RNOC during that period.



*VIRTUAL DAYS BEGAN IN LATIN AMERICA

With the support of the advanced networks in Mexico, Colombia and Brazil -CUDI, RENATA and RNP -, **GISELA** and RedCLARA began a series of virtual meetings to which researchers, S & T authorities and technicians of the region have been invited, to meet and discuss various issues associated with the potential of the e-Infrastructure and the management of new computing services.

Under the slogan “doing more with less”, the “Cycle of Regional Sessions for a New Science” was held in October and November of last year, looking to encourage reflection on possible scenarios to consolidate a collaborative service of advanced computing in Latin America. This cycle of activities, driven by the Transition Group of the **GISELA** Project to RedCLARA involved, through various videoconferences, regional authorities in science and technology, as well as experts and researchers in various strategic scientific areas for their social impact and demand for large computing resources and data storage (bioinformatics, health, telemedicine, environment, natural hazards and disasters, etc.).

Sesiones regionales para una nueva ciencia
Del 27 de octubre al 4 de noviembre de 2011

Comunidades de Investigación
Redes Nacionales de Investigación
Organizaciones Nacionales en Ciencia y Tecnología
Universidades y Centros de Investigación

Ciclo de videoconferencias para conocer escenarios y tendencias en los servicios de computación avanzada.

Reflexión conjunta para construir un servicio de computación avanzada a la medida de América Latina.

e-ciencia para resolver nuestros grandes problemas, haciendo más, con mucho menos.

- Gran capacidad de cálculo y almacenamiento de datos para simular situaciones de riesgos, promover soluciones compartidas, realizar prospectivas, potenciar la educación, preservar nuestra historia.
- Para los historiadores, para los médicos, para los bioinformáticos, para los artistas, para los astrónomos, para exploradores geográficos... ¡Para Ud!

Más detalles: www.cecatic.ula.ve/gisela

Día Virtual de Cultura 28 de marzo, 1:30 pm

La actividad tiene como objetivo introducir el tema cultural y de las artes y su relación con el mundo de las redes avanzadas, mostrando casos de éxito e iniciativas de uso de la e-Infraestructura en beneficio del patrimonio cultural y propuestas estéticas en diversas modalidades, así como el encuentro entre diversos actores involucrados con el sector en América Latina.

Invitados:

- **Lina Barrientos**, Comunidad ACHALAI: Red-Encuentro con el Son-Ido Prehispánico
- **Saúl Juárez Mena**, Coordinador de Internet2 Consejo Nacional para la Cultura y las Artes de México (CONACULTA): Aplicaciones Culturales, Artísticas y Educativas sobre Internet2
- **Martín Levenson**, Coordinador Nacional de Desarrollo Institucional (INAH- México): Repositorios de Fototeca, Códices y Colecciones de museos. Paseos Virtuales del INAH.
- **Ivani Santana**, Comunidad MapaD2: Mapa e Programa de artes em dança (e performance) digital
- **José Murilo** Coordinador-Geral de Cultura Digital, Ministerio de Cultura de Brasil: Experiencia RNP y Ministerio de Cultura de Brasil

Sala ULA: sala de videoconferencias de la Facultad de Ingeniería, nivel patio. La Hechicera
La actividad también podrá ser seguida por video streaming:
<http://comunidades.redclara.net/videoStreamingDVC.html>
Las preguntas podrán hacerlas a través del chat de Skype: diasvirtuales@redclara.net

On the other hand, the First Virtual Culture Day was held in March in which artists, managers and stakeholders in the cultural sector were invited. The activity aimed to introduce the topic of culture and arts and their relationship with the world of advanced networks, showing success stories and initiatives to use the e-Infrastructure for the benefit of the cultural heritage and aesthetic proposals in various forms, and as an encounter between different actors involved in the sector in Latin America.

On May 8th the Virtual Infrastructure Day is planned, designed to provide an overview to researchers in Latin American about the opportunities and benefits of services and computer tools and virtual cooperation in diverse areas of knowledge.

* ECUADOR IS BEING TRAINED IN GRID INFRASTRUCTURE

GISELA and the National Network for Research and Education of Ecuador (CEDIA) organized a workshop on Grid, attended by researchers and technicians interested in the use of advanced computing resources for research in Ecuador. The workshop, held in January in the city of Cuenca, was given by Gilberto Diaz, of the GI-SELA project at the University of Los Andes (ULA, Venezuela) and Juan Carlos Escobar, lecturer at the Industrial University of Santander (UIS, Colombia).

The workshop was conducted in two parts: one aimed at administrators, whose content was primarily focused on the description of the gLite middleware and the installation and configuration components on the Grid platform, as well as the Science Gateway environment, and the second section aimed at users, focused on the basics of Grid computing of the GISELA Project, steps and major protocols, and the incorporation of researchers to this infrastructure in the region.

As Gilberto Diaz explained, participants showed great interest in using the Grid platform and gave the first ideas to initiate using the available resources, mainly in the area of data management for climate, initiative that would have great weight on the Climate Re-

search Institute of Ecuador (INAHMI). “We ran some applications in the GISELA Science Gateway, like ClustalW, and participants saw the possibility of avoiding cumbersome commands. Now they must start the integration of meaningful applications to research groups in Ecuador.” In fact, some of the technicians who participated in the workshop belong already to the group being trained to integrate the first regional applications to the GISELA Science Gateway (GSG).



Luis Puchaicela: the activity has allowed foreground knowledge of the infrastructure to install and manage it

For Luis Puchaicela, researcher at the Institute of Applied Chemistry, Technical University of Loja and workshop participant, this was an opportunity “of great importance for all institutions involved in this project and has allowed foreground knowledge of the infrastructure to install and manage it. Now the road focuses on establishing the CEDIA members with the possibility to have researchers or research which use applications already ported to Grid environments.”

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tailored to the needs of Latin America

A large amount of computers and storage provided by the project partners, is now available for groups of scientists working on problems that demand high quantities of computing resources, that without this e-infrastructure would be difficult to solve.

<http://www.gisela-grid.eu/> 