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WHEN FORTUNATE CIRCUMSTANCES HELP **TAKING LONG-STANDING DECISIONS!**

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I don't know if you feel like me, but analysing afterwards the occurrence of important events/decisions, I sometimes get the sense that a few things, some by coincidence, come just in time to interfere constructively to stimulate the right people to eventually make the right longstanding decision.

For me it started incidentally, on the plane on my way to Mexico City, coming to the GISELA-CHAIN Conference. I read a very praiseful press article on the status of the Mexican economy. It was observed that its yearly grow rate of 5% was of the highest in the world and claimed that, within less than ten years, México will become the 5th economical world power, with substantial income from the innovative sector.

Then, I discovered the beautiful Mexican style of the *Unidad de Seminarios de la Universidad Nacional Autónoma de México* (UNAM) in the middle of the magnificent tropical *Jardines del Pedregal*. I could immediately appreciate the kindness of the Local Committee people, the functionality of the Conference room, which led me to infer that the Conference could not start under more auspicious circumstances. (Have a look at the smiling faces of all participants in the Conference picture if you don't believe me.)

On the other hand, I was still embarrassed by our ambiguous choice to have two rather different Conferences focuses:

- To present the scientific outcomes of GISELA;
- To discuss the long-term sustainability of the Latin American e-Infrastructure,

which addresses different kinds of people - Researchers in the first case, and Policy & Decision Makers and Academic authorities in the second case.

In French we say: *"Be careful not to run behind two hares at the same time."* We had a long internal debate while deciding upon the Conference scope - on choosing only one objective and which one. Eventually we took what often happens to be the wrong alternative, namely to keep both and let them cohabitate, hopefully peacefully, during the three days.

I rapidly felt reassured by the tone of the various inauguration talks. All are very well reported in the last GISELA Bulletin, but I would like to highlight for you the following opinions:

- *"Latin America should wake up in the subject of e-Science and move faster to respond institutionally to this new way of generating Knowledge."* said in substance Prof. **Luis Mier y Terán** (Deputy Director of Planning and International Cooperation of CONACYT Mexico);

- On his side Prof. **Felipe Bracho** (Director of Computing and Information Technology, UNAM) underlined the important role that Mexico has to meet in consolidating academic networks, and he stressed that UNAM is committed to scientific collaboration in Mexico and the region. *"Behind these platforms are networks of people and ultimately it is these people that collaborate"*, he concluded.

After these first encouraging presentations, we listened to many sound testimonies in support of the utility of the GISELA e-Infrastructure to Latin American - European scientific research collaborations. Moreover, we had the chance to have the most entertaining talks from the Invited Speakers, showing what e-Science is bringing nowadays that traditional research approaches can't afford anymore. For example:

- The WeNMR EU-funded Project, which aims at "bringing GRID computing to a worldwide Structural Biology Community" with over 60 collaborators from Argentina, Brazil and Venezuela (A. Bonvin's contribution);
- The Information Management System - LIMS - real breakthrough in the treatment of NMR information (J. Wist's contribution);
- The LAGClima Project using Grid for Climatology forecasts over the whole LA region (Ph. Navaux's contribution).

In addition, we heard about several wonderful initiatives from User communities potentially interested in establishing or extending collaboration with Latin American Institutions active in their field. Let me mention a few cases of initiated collaborations of the utmost social and societal interest in Latin America:

- The global effort to develop a Worldwide e-Infrastructure for computational neuroscientists to fight Alzheimer's and other Related Diseases (ADRD) through the recently created Global Alzheimer's Association Interactive Network - GAAIN - (A. Redolfi's contribution);
- The Pan-American Telemedicine Network - PATN - that aims at establishing Telemedicine nodes in Latin America (A. Vargas's contribution);
- The Mesoamerican Territorial Information System Project - SMIT - whose scope is the protection against natural disasters in the Mesoamerican area (S. Jalife's contribution).

Not to forget the *"Cerise sur le gâteau"* (in French), the pre-announcement of the first observation of a particle consistent with the Higgs boson, news which transformed into a snowball being rolled all around the world on the TV and in radio flashes, thus generating a kind of *Higgsteria*. The GISELA Community was particularly excited by the information. Indeed several Latin American Institutions, members of GISELA, such as UFRJ, UNAM, ULA, etc. are using its e-Infrastructure, in the framework of the Computing model of the LHC experiments in which they participate.

All together, these many talks, advertisements contributing nicely to give the exact picture of the scientific and social impact of e-Infrastructures in Latin America, were most useful input to the policy & decision makers for the forthcoming discussions on sustainability.

But what was really behind this "sustainability" dilemma? To figure it out one should have in mind that, since the early EELA and EELA-2 projects, e-Science was viewed by the various Latin American stakeholders as a kind of Ecosystem that should evolve to become sustainable at minimal cost. In practice, it means that beyond the EU-funded Projects, the future of the e-Infrastructure operation and user support should be handed over to the Latin American region.

This translates into:

- Securing the support of the local Resources Centres. Happily, well in the spirit of Grid Computing, the large majority of collaborating Academic Institutions clearly indicated that they would continue to do it as most of them did since the EELA's time.

- Consolidating, on the long term, the Core Team in charge of the e-Infrastructure operation, User support, Dissemination and Training. Until now, GISELA had experienced the same severe difficulties as other Regional e-Infrastructure initiatives in identifying the durable funding of this Core Team. To be clear, no viable solution had emerged up to now.

We had foreseen two "sustainability" sessions with the secret hope that some solution would come out of discussions, thus preventing 6-7 years of enthusiastic promotion of e-Science getting lost! In all cases, we expected a rather animated exchange of views. As usual, things started with a general consideration of the sustainability theme without really tackling the core of the subject. And…. it was at this very moment that things, **unexpectedly**, moved rapidly on:

- Bernard (our dear Project Coordinator) stood up, took the microphone and simply said: "Hey guys, these circumvolutions on sustainable ecosystems are most entertaining, but what are we speaking of in practice? I'll tell you: we are simply, but unsuccessfully up to now, looking at funding a team of less than 10 people to support e-Science over the whole Latin American region!";
- This direct statement created a bit of confusion, followed by a few seconds of silence, with many people looking down at their shoes… until Prof. Carlos Casasus, CUDI' Director, took the floor. I should remind you that our friend Carlos was always one of the most fervent supporters of EELA, EELA-2 and GISELA. He started, with his well-known affable voice, to confirm the nice words of Prof. Luis Mier y Terán in his opening speech, and then he declared in substance that Mexico was eager to take a major responsibility in the future of e-Sciences in Latin America and was ready to take all the necessary steps to achieve it;

I personally almost fell over, and instantaneously reacted a bit coarsely, thinking to myself: "Gooooooooaaaaaal!!!" and more calmly "Gods are with us today…!" Moreover, Carlos's statement stimulated, on the spot, Ecuador and Colombia representatives to announce their willingness to join Mexico. All Conference attendees applauded loudly. The history of e-Science in Latin America had just made a real step forward.

- Keeping his self-control (and realism), Bernard warmly acknowledged all stakeholders but asked for a written document, to "engrave in stone" the fresh engagements. (You know, sometimes, nice words can get lost!). And it's like this that the distinguished *"Mexico Declaration"* was born. (See the last GISELA Bulletin for all details).

With some recoil we should recognize that, even though circumstances were most favourable, it was more due to the past achievements of the EELA, EELA-2 and GISELA projects, and the dedication of all their contributors from their home institutions, that made it happen. Eventually, it is a great satisfaction for the whole GISELA Community to realize that indeed: "The future of Latin American e-Science is on the good trail" and thus to conclude that it has (well) done its job.

Finally, I can't forget that everything started on July 8th, 2004, with a mail from Dr. Fabrizio Gagliardi (CERN - Director of the 1st EGEE Project) asking me:

"Hi Philippe,

Do you still have good contacts with Brazilian HEP? The EU is encouraging me to extend EGEE collaboration with South America. The Brazilian part of the project could be easily funded as part of the EU CLARA initiative. Would you like to be involved yourself?"

At that time our dear friend Juan Antonio Rubio was Director of the *"Education & Technology Transfer"* Department of CERN and most active DG's Adviser for the Cooperation with Latin America. He immediately declared his intention to provide full CERN support to the elaboration of the 1st EELA Project. A couple of months later, he became DG of CIEMAT (Spain) and considered the development of e-Science in Latin America one of the priorities of his mandate. At the moment to end up the GISELA Project, we should remember his continuous support in the most difficult situations and be most grateful to his memory.

GOODBYE GISELA!

After 7 years of experiences promoted by Europe for the Grid infrastructure in Latin America, GISELA, the last of the projects in this phase, it is time to say goodbye. With working packages leaving the way open on the issue of e-Science in the region in terms of technological and organizational platform, and a transition team that handled the local needs to adapt an advanced computing service proposal, together with RedCLARA, the idea of applying a model of sustainability on the issue is on the table, thanks to a team of over a hundred people, from Europe and Latin America, that joined the effort.

Around headlines and events

GISELA counted with the Venezuela (Universidad de Los Andes) members of the Work Package in charge of distributing the necessary message on Grid and associated services in the Latin America countries as well as organizing events.

From maintaining a coherent and attractive image, with speeches worked journalistically, creating outreach strategies aiming at researchers, doing consumer surveys of technology, to organizing GISELA events, this Work Package creatively designed activities to attract audiences in the region, supported extensively by the national networks.

WP2: Dissemination and Outreach

Work Package 2 (WP2) focuses on advertising the project through bulletins, web sites, news, meetings, and so on. It also looks for potential research groups that may benefit from the Grid e-Infrastructure.

Its main functions were:

- Raise awareness on the e-Infrastructure and Virtual Research Communities (VRC), advertising GISELA between researchers and decision makers in Latin America.
- Design and develop the means to meet potential beneficiary communities GISELA.

WP2 members:

- **Herbert Hoeger:** manager
- **Ysabel Briceño:** deputy manager
- **María Eugenia Hernández:** design and illustration
- **Alicia Bohórquez:** translations

Effort and persistence

For Herbert Hoeger (ULA, Venezuela), manager of this Work Package, the extensive work in terms of organization and development of events, the generation of promotional material such as flyers, bulletins, posters and others, and dissemination through web sites, mailing lists, Twitter, blogs and other newsrooms from institutions and academic networks, is undeniable. “This has allowed **GISELA** and its achievements to reach a large number of people.”

As a major challenge, this Work Package was faced with the daunting task of interacting with people. “This is not always easy, says Hoeger. Getting together users and potential users around the project activities required effort and persistence. As an example, on a survey carried out to try to establish the perception of users about the usability and benefits of the e-Infrastructure obtained and effective response for only half of the people surveyed. The work of attracting new communities and applications to the e-Infrastructure is also not an easy task. “

Hoeger described the integration experience between Europe and Latin America over the EELA, EELA-2, and **GISELA** project as remarkable, considering the network of European and Latin American people that was generated by these projects and around these technologies. “A team of trained people and users has been integrated.”

What is needed to keep going on?

We must continue the task of spreading the benefits of this type of e-Infrastructures, finding financial and political support for them, as well as the integration of new communities and applications.

H.Hoeger: The network of people between Europe and Latin America around these technologies is outstanding.

The Science Gateway for Latin America

Italy (INFN) and Spain (CETA-CIEMAT) accounted for the members of this Work Package, whose main efforts were directed at transferring the European expertise to promote regional initiatives associated with Grid services, contributing to basic and specialized support to the Project GISELA.

WP3: Support for User Communities

This Work Package served as a liaison between GISELA and international initiatives such as the EGI European project, around Grid. WP3 focused on providing support and training for the project community and potential developers in the region.

The main functions were:

- Computing resource operation support
- Middleware service development
- Digital identity management
- Grid technology induction
- Grid enabling application support
- Application tutorials

WP3 members:

- **Diego Scardaci:** manager
- **Rafael Mayo:** deputy manager
- **Guillermo Díaz:** deputy manager

Making users to fall in love

The trophy of this Work Package has a name: the Science Gateway for Latin America, an innovative tool that allows scientists to run applications in the e-Infrastructure through a web browser. “It certainly has been the best of successes in our Work Package, says Diego Scardaci, WP3 manager. We have offered users in Latin America a new and modern way to exploit the network infrastructure. “

Scardaci explains the benefits of the **GISELA Science Gateway**: it hides several Grid technical details for the final users and gives them a simple way to access the Grid through Identity Federations (avoiding to manage Digital Certificates that

hindered the spreading of the Grid in the past). In this way users can exploit the Grid infrastructure without knowing the underlying interface and grid protocols.

“This new model to use the Grid got a big success. Now we have about 150 users registered in the **GISELA Science Gateway**”.

Scardaci, summarized the work of supporting users as difficult task to face given the diversity in the demand. “The biggest challenge of this work package is to try to fully satisfy the heterogeneous users needs showing the best way to use the Grid for each community. We consider that as our gold rule to reach the WP targets. The **GISELA Science Gateway** helped us a lot providing a modern tool that highlight the grid benefits hiding the underlying complexity.

As a wonderful experience qualifies Scardaci the integration between Latin America and Europe in the subject of Grid. “Thanks to this experience Latin American countries have now a very powerful tool, the Grid e-Infrastructure, to improve their scientific processes.”

The impact of the Grid in LA will be better highlighted in the next years when scientists, working on high impact applications as, for example, medical and disaster mitigation, will start to produce the first results that could change the life of Latin American people.

In your opinion, what is needed to keep going?
Latin America now has all the bricks needed to build a team to fully manage the Grid Infrastructure. Thanks to EELA, EELA-2 and **GISELA** projects several LA people are able to manage the Grid Infrastructure central services, to manage the single resource centers, to support the users, to port new applications on the Grid.

Moreover, thanks to the last training events, we created a local team to manage the **GISELA Science Gateway** and a local Task Force able to integrate new applications on the SG.

In any case, the European support will not disappear a day after the end of the project. INFN, my institution, will continue to host the **GISELA Science Gateway** until the LA people will be ready to install it in a LA country and will continue to provide help to port new applications on the **GISELA Science Gateway**. INFN will make official this engagement before the end of the project.

Diego Scardaci: the first results that could change the life of Latin American people.

Making a sustainable infrastructure

WP4 is in charge of the operation of the infrastructure. People in Brazil (UFRJ), Colombia (UNIANDES) and Mexico (UNAM) undertook the difficult task of integrating the contributions of the region in terms of shared resources.

Between negotiations and strategies, so that the countries could effectively integrate their resources through organizational and operational oversight, this Work Package aimed at building a regional pathway for the sustainability of the Grid platform.

WP4: Infrastructure Services

The Work Package focused its efforts on the integration of resources and operational oversight to keep in shape the distributed platform.

Among the most important are:

- Support Grid services, the development and deployment of services such as ticketing systems, Resource Centre databases and mailing lists, among other.
- Deploying core Grid systems, Resource Centre integration, Grid Regional Centres establishment and support, as well as the proper infrastructure oversight.

WP4 members:

- **Ramón Diacovo:** manager
- **Harold Castro:** deputy manager
- **Jesús Cruz:** deputy manager

Gaining knowledge

Ramon Diacovo, WP4 manager, said that becoming a Resource Infrastructure Provider to **EGI** has opened many doors. “Not only it has provided us access to a very useful set of operational tools, but it has also facilitated knowledge sharing, since we’ve been put in close contact with other teams from all around the world. Direct access to gLite middleware developers is also another very handy consequence, especially when new features need to be requested.”

As a major challenge, this Work Package was faced with the task of enforcing the commitments of all partners and involve them with the federation of resources. “Integrating the resources of an e-Infrastructure like **GISELA** is not a technically difficult task, but that’s only after an institution has overcome the usual hardware and manpower acquisition problems - Diacovo said. It seems that some of our partners underestimated the non-grid aspects before signing resources commitment to **GISELA**,

causing unfortunate late integrations or failures to comply with their pledges. Resources from institutions that are not **GISELA** official partners help mitigating a lot of this, keeping the impact on the end-user to a minimum. “

The integration between Europe and Latin America in the Grid area, with the experience of EELA, EELA2 and **GISELA**, was qualified by Diacovo as great, in regard to the e-Infrastructure.” An impressive amount of knowledge has been gained over the course of the three projects in diverse subareas: Resource Centre administration, gLite middleware intricacies, Virtual Organization offering and support, operations… Adopting standards as opposed to developing and making them interoperable saves effort, and this effort can be redirected to other tasks, effectively lowering the overall cost of maintaining the grid.”

What is needed to keep going on?

I would say profiting from the good position we’re in to secure manpower and computational resources in the long-term is the best immediate line of action. Applications, dissemination and the e-Infrastructure services are all running at the moment; if there is a time when we have good things to show about the usefulness of the grid to governments and potential “sponsors”, that time is now.

The second step would be to increase the dissemination effort in order to get more users. An increased demand would certainly help bringing more resources to the table, which would in turn make the e-Infrastructure more attractive, bringing more users… snowballing.

Ramón Diacovo: The region has acquired an impressive amount of knowledge on the subject of Grid.

Monitoring performance

Between Venezuela (ULA) and Brazil (UFRJ), together with CLARA, members of this Work Package (WP5) sought measurements mechanisms to check the performance of the networks that interconnect the Resource Centres of the Grid infrastructure.

In order to provide reliable network resources for the e-Infrastructure, WP5 managed the relations between GISELA, RedCLARA, the European academic network (GEANT) and national research and education networks in Latin America.

WP5: Network Resources

Focused on activities related to network resources, this Work Package led engineering and operations support and sought to automate the processes in the provision of connection services.

The main functions are:

- Supervise the interactions between GISELA, the NRENs and continental backbones for operational issues.
- - Link with network providers on issues concerning the deployment of new Networking Infrastructure and Services and of the adoption of networking operational procedures defined by GISELA.

WP5 members:

- **Gilberto Díaz:** manager
- **Leandro Ciuffo:** deputy manager

On Hand with RedCLARA

The consolidation of a prototype for the performance monitoring platform of the various networks that interconnect resource centres of the **GISELA** infrastructure can be considered as an achievement. Likewise, the establishment of a collaboration with the RedCLARA measurements group (GT-Mediciones) to integrate this prototype in the efforts taking place in the academic networks of Latin America.

Gilberto Díaz: RedCLARA gives continuity to the network monitoring activities.

As a challenge, this Work Package concentrated efforts to reach agreements with the administrators of the resource centres to incorporate the network monitoring service, the task served as an important bridge with the RedCLARA GT-Mediciones team, where it aims on the continuity of the network monitoring activities.

Díaz noted that the most important contribution during the development of the EELA, EELA-2, and **GISELA** projects has been training people and the establishment of a service platform. “This allowed the incorporation of Grid computing to our region in a more expeditious way than it would have been done otherwise.”

What is needed to keep going on?

The further development of the monitoring platform is important, not only for well-functioning of the Grid infrastructure, but for any other research initiative in the region.

Customized for users

Brazil (FCG) and France (CNRS) topped the list of members of this Work Package, from which it was intended to extend the usability of the platform, from a portfolio of applications and infrastructure services, with comprehensive support to virtual research communities in the region.

WP6: Infrastructure and applications user communities

To this work group it was central to provide comprehensive support to users, by offering a portfolio of services and care of needs of virtual research communities of the region.

Among the main features are:

- Provide support and customization so that more application developers and system administrators can utilize these services.
- Develop new application-related and infrastructure-related grid services that can facilitate the use of the infrastructure by the application developers and the management of the e-Infrastructure by system administrators.

WP6 members:

- **Francisco Brasileiro:** manager
- **Vanessa Hamar:** deputy manager

e-Science culture as profit

The flag of success of this Work Package was the creation of a regional cooperation in the area of middleware development, and to produce and maintain a broad portfolio of services for users of **GISELA**, in close collaboration with other Work Packages (WP3 and WP4), as highlighted Francisco Brasileiro, WP6 manager. WP6 faced the difficult task of discovering the real needs and requirements of our users, he said, who also relates the EELA, EELA-2 and **GISELA** experience as a crucial period for the dissemination of the e-Science culture in Latin America.

Francisco Brasileiro: regional cooperation was important in the development of middleware

What is needed to keep going on?

We need to leverage the human resources network that has been created in the last 7 years to further develop e-Science related activities in the region. I expect that CLARA will have an important role not only in guaranteeing that the legacy infrastructure build in these projects will continue available to the Latin American scientific community, but also that more interaction and cooperation between the different Latin American research groups is enabled by this infrastructure.

WITH **LOCAL FLAVOUR**

The transition team, consisting of Colombia, Mexico and Venezuela contributed to the appropriation of skills and practices for the operation of the advanced computer service in Latin America. Organizational strategies, negotiations and a proposal for sustainability were the main tasks. The team, coordinated by Luis Nunez (CLARA) and Salma Jailfe (CUDI, Mexico), was in constant awareness to transform the conditions of the region for a strategy with local flavour.

Seeking massive use

For Luis Núñez, being able to generate a commitment by some national research networks in the region to further develop advanced computing services is the main success of this team, and having built an organization to manage the infrastructure across the continent.

However, Núñez warns of the risk of gambling for long periods on a specific technology that can lose its charm, as is the case for Grid. “The complexity to use it and the advent of other computation mechanisms has meant that much of the expertise gained during these years can lose meaning.” This aspect, being a great challenge, led the transition team to make proposals with flexible technologies, in which grid is only a part.

Luis Núñez : the great contribution is the integration between Europe and Latin America.

The main contribution of these projects is the integration of European experiences with Latin America, says Núñez. “On this there is no doubt, but the work of alignment between the European vision and the actual local needs with regard to the service model was not easy.” This, and the idea of an academic community that in general has interests away from advanced computing were also difficult conditions to deal with.

- What is needed to keep going on?
- Aiming at high usage applications to exploit the use of e-Infrastructure across the continent. No need to focus on sophisticated applications used by only a few research groups, but applications that can be used by students, to change the culture of the local computing to on-line computing.