

# How do you say grid computing in Spanish?

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(PhysOrg.com) -- Encouraged by the success of grid computing in Europe, scientists there set out to help their Latin American colleagues develop grid capability. The result today is a thriving trans-Atlantic collaboration.

Researchers who need to store and manipulate massive amounts of data can't always get time on a supercomputer or supercomputer network. One very successful solution has been to build and use grids that link hundreds or thousands of ordinary computers.

With enough computers and the right software, a computing grid can rival a state-of-the-art supercomputer.

European and North American scientists - starting with the high-energy-physics community - have had the benefit of [grid computing](#) for many years. However, their peers in regions such as [Latin America](#) and Africa have not, with the result that they often could not carry out front-line research in computationally demanding fields.

The EELA project (E-infrastructure shared between Europe and Latin America) was formed with the aim of increasing collaboration between Europe and Latin America in grid technology, a field of growing importance to both regions.

“In areas such as high-energy physics, [biomedicine](#) and climate, the level of accuracy in your results depends on the level of accuracy of your simulation,” says CERN’s Philippe Gavillet, deputy project coordinator

for EELA and its follow-on project, EELA-2. “We had a demand from our Latin American colleagues to be able to contribute, and this was one way to help them, by building up their computing resources.”

By the end of the first EELA project, in December 2007, it had succeeded in creating a working Latin American grid that networked 3000 computers and could store 700 terabytes (billions of bytes) of data, supported by 30 resource centres.

Hundreds of Latin American researchers have now used the EELA-inspired grid to carry out research in climate modelling, high-energy physics, biomedicine and a variety of other fields that otherwise would have been out of reach for them.

One of the most important research projects to which EELA contributed was WISDOM, which used some 5000 computers in 27 countries to analyse over 140 million interactions between potential anti-malaria drugs and the malaria parasite.

An added benefit is that the EELA projects have fostered increased cooperation and collaboration between European and Latin American researchers. “Building networks of scientists with the same professional interests has been a very nice outcome,” says Gavillet.

The success of EELA led to EELA-2, which aims to enlarge the Latin American grid, make it easier to use, and make sure that it is self-sustaining in terms of organisational and financial support.

## **EELA builds a grid infrastructure**

Creating a functional grid presents many challenges. The first is linking a number of computers via the internet or through dedicated high-speed

networks.

Equally important is developing useful middleware - user-friendly interfaces and programs to enable access to the system, provide security, manage data storage and retrieval, divide calculations into appropriate pieces, distribute them to the networked computers, and retrieve, organise and store the results.

The EELA team relied on a package of middleware called gLITE, initially designed to manage the grid that CERN relies on to process the floods of data from the Large Hadron Collider and other high-energy physics research.

EELA-2 researchers added new features to gLITE that let it be used by scientists performing many different kinds of research. In addition, they adapted a version of gLITE that runs on computers using Windows operating systems, rather than linux.

Even with those modifications, researchers working in small groups with limited IT support needed something simpler. EELA-2 chose to implement OurGrid, a system designed to communicate with a large number of computers and use them when they would otherwise be idle.

Besides being easier to use than gLITE, OurGrid allows each computer to work on its part of the calculation independently. This eliminates the need for high-speed connections linking the participating computers.

“OurGrid is very convenient to use and is becoming widespread,” says Gavillet. “It doesn’t need all the resources that gLITE requires, and is much more appropriate for small institutions.”

EELA participants have also been active in providing training throughout Latin America, plus presentations and workshops at a variety

of international meetings.

## **EELA-2 focuses on sustainability**

EELA-2 currently (summer 2009) links 78 institutions from 16 Latin American and European countries, and supports more than 50 research projects from a wide variety of scientific fields.

Even with a burgeoning Latin American grid in place producing an increasing flow of research results, Gavillet and his colleagues on both sides of the Atlantic knew that they had only accomplished half their task.

What remained - and has proved as challenging as creating the Latin American grid in the first place - was to make it self-sustaining.

“The first objective in such an adventure,” says Gavillet, “is to make sure that what you have built will stay in the long term.”

Gavillet sees signs of progress towards sustainability, but with the EELA-2 project winding down, he is acutely aware that more work needs to be done.

“We have a clear strategy and we’ve very carefully costed all aspects of running and supporting the infrastructure,” he says. “We’ve described the goal and the means, and through our collaborators, worked with decision-makers in all the involved countries.”

Still, he says, gaining the political support to fund the project long-term is a very difficult task.

EELA-2 has found a potential ally in CLARA (in English, Latin American Advanced Networks Cooperation), an international

organisation with a strong interest in advancing academic computing in Latin America.

Gavillet hopes that by combining forces with CLARA, EELA-2 can gain the local funding and organisational support that will let it continue to foster cutting-edge scientific research in Latin America.

More information: [www.eu-eela.eu/](http://www.eu-eela.eu/)

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