4th EGEE Meeting, PISA

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E-Infraestructure shared between Europe and Latin America

www.eela-grid.org

EELA applications

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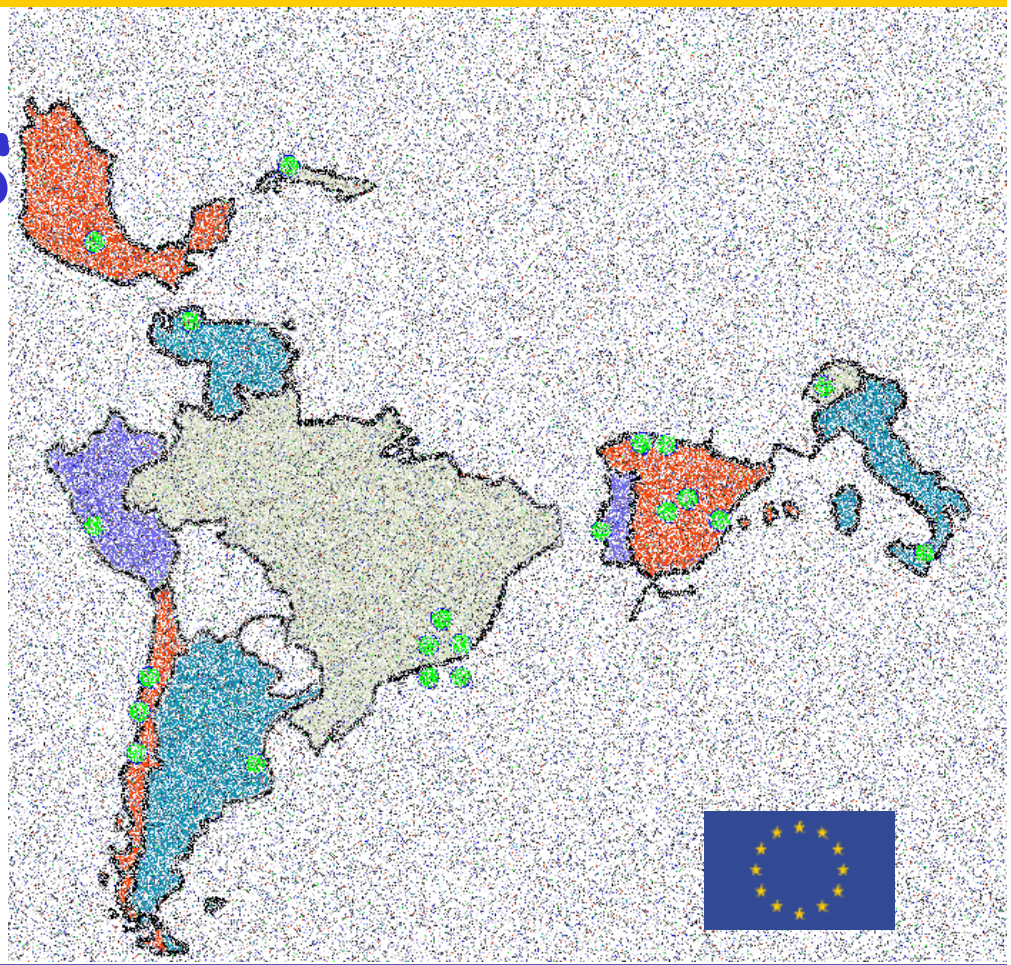

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Road map

- Objectives of EELA
- Partners
- WP3, identification & support of grid enhanced applications
  - Biomedical application
  - High Energy Physics applications
  - E-learning
  - Climate prediction

Objectives

Objectives

The overall goal can be structured into the following three objectives:

- **Objective 1:** Establish a human collaboration network between Europe and Latin America.
- **Objective 2:** Setting a pilot e-infrastructure in Latin America.
- **Objective 3:** Identifying and promoting a sustainable framework for e-Science in Latin America.

Partners

Partners

EU

- Spain: CIEMAT, CSIC, UPV, RED.ES, UC
- Italy: INFN
- Portugal: LIP

Latin America

- Venezuela: ULA
- Cuba: CUBAENERGIA
- Chile: UTFSM, REUNA, UDEC
- Peru: SENAMHI
- Mexico: UNAM
- Argentina: UNLP
- Brazil: UFRJ, CNEN, CECIERJ/CEDERJ, RNP, UFF

International:

- CLARA
- CERN

WP3

WP3

- Four areas has been identified as objectives in the proposal:
  - Biomedical applications.
  - High Energy Physics applications.
  - E-learning.
  - Climate prediction.

Biomedical applications

Biomedical

- The objective of the Biomedical Application Identification and Support task will be two-fold:
  - first, to migrate and deploy the biomedical applications already identified and migrated in EGEE, making profit of the pre-existing know-how on the application, grid-enabling and deployment;
  - and second, to assist on the identification and migration.

Candidates applications I

- gPS@ application
  - Grid Protein Sequence Analysis,
  - http://gpsa.ibcp.fr
  - pilot application of the EGEE project
- GATE, GEANT4
  - Application to Tomographic Emission.
  - Based at GEANT4
  - A platform for accurate simulation of nuclear therapy and tomographic emission will reduce the morbidity and secondary effects of current practice
  - http://www-lphel.epfl.ch/GATE/

Candidates applications II

- CDSS
  - A Clinical Decision Support System on the Grid,
  - http://egee-na4.ct.infn.it/biomed/CDSS.html
- Visual Monte Carlo
  - Project that consists fo a graphical user interface and Monte Carlo method software to assess ionizing radiation dose in the human body for some irradiation geometries.
  - http://ird.gov.br/vm

Biomedical, actors

- UPV (Spain), Coordinator
- CNEN (Brazil)
- CUBAENERGIA (Cuba)
- UFRJ (Brazil)

HEP applications

HEP I

- The HEP area of the EELA project aims at extending the currently existing experience on both sides of the Atlantic Ocean to the rest of L.A., attracting new users in the area and facilitating the research on particle physics.
- The deployment of an interactive analysis GRID enabled application based on the CrossGrid experience together with the expansion of the MC simulation are the two main efforts in this area.
- EELA aims to set up a framework, where specialized groups of researchers can develop, test and deploy HEP applications by using a common infrastructure. This will improve the current exchanging of information and solutions between the groups.

Candidates applications I

- Monte Carlo Production
  - ALICE and LHCb MC applications that have been successfully run on the Grid.
  - For example, GAUSS – Event Generator and detector Simulation, BOOLE – Digitization Program and BRUNEL – Reconstruction Program simulate LHCb events and the GRID tool used to link them is DIRAC – Distributed Infrastructure with Remote Agent Control.
  - http://lhcb-comp.web.cern.ch/lhcb-comp/

Candidates applications II

- Interactive Analysis.
  - The LHCb Collaboration performs interactive analysis using DAVINCI and the visualization tool called PANORAMIX. The ARDA project provides the GRID upper-middleware common to all LHC experiments. In particular, ALICE and LHCb are moving their development of interactive analysis applications to ARDA.

HEP, actors

- UNAM (Mexico), Coordinator
- UFRJ (Brazil)
- UTFSM (Chile)
- UNLP (Argentina)

E-learning

E-learning I

- The goal of this task is then to use some of the concepts of “the Grid” such as secure, transparent, and ubiquitous access to resources, not only to help teachers in their continuous research of new ways of teaching and students to improve their formation independently of their geographic location, but also to have access to remote content and resources produced by other institutions, in a cooperative way.
- The EELA project, through this task, will furnish an environment that is able to profit from GRID technology in the preparation of educational material as well as in self-training and self-directed learning.

E-learning II

- This includes the provision of semantic capabilities to the GRID environment. Also, the skills of students in science (physics, mathematics, chemistry, biology and computing) will be improved by learning them to use grid computing in order to solve computer intensive problems.
- This will contribute to the shortening of the so-called digital gap.

Candidates applications

- **Laboratorio Experimental Multidisciplinario a Distancia.**
  - Already in gridification stage.
  - http://www.hydra.dgsca.unam.mx/lem-grid
- **Quantitative study of mechanical oscillations.**
  - currently in implementation phase at UFRJ and CECIERJ/CEDERJ.

E-learning, actors

- CECIERJ/CEDERJ (Brazil), Coordinator
- CIEMAT (Spain)
- CUBAENERGIA (Cuba)
- UFRJ (Brazil)
- UNAM (Mexico)

Climate prediction

Climate prediction I

- El Niño phenomenon is a key factor for Latin-American climate prediction.
- The different activities included in climate prediction can be roughly classified in numerical model simulation and forecast production, and data access/exchange and data analysis.
- The EELA proposal focuses on transferring the organisational model of the European project EGEE into Latin-American Countries.

Climate prediction II

- Thus the objective of the Climate Prediction package will be the migration and deployment of applications developed in previous EU founded projects (DATAGRID and CROSSGRID), focusing on an important problem with many social and economical implications.
- Climate application in EELA will exploit the grid, as a new framework in which user-friendly data mining climatologically tools can be successfully deployed.

Climate prediction, goals

- The first goal of this task is the migrations of pre-existing data access/sharing tools appropriate for environmental data files (climate simulations and observations).
- A second goal is the migration of data mining clustering algorithms to GRID (both standard methods and neural network Self-Organised Maps SOM). These algorithms will relate both climate simulations and local observations performing what is called a downscaling process. This will allow users to obtain not only raw data, but also spatial climatic patterns of interest associated to their problems and climatic variables of interest.

Candidates applications

- Data miming in meteorology.
- Extration automatically of patterns from the climate simulations.

Climate prediction, actors

- UC (Spain), Coordinator
- UDEC (Chile)
- SENAMHI (Peru)

Final Considerations I

	Participant	EC Funded PM
1	CIEMAT	16
2	CSIC	0
3	UFRJ	3
4	UPV	11
5	ULA	0
6	CNEN	9
7	INFN	0
8	CUBAENERGIA	24
9	UTFSM	4
10	CLARA	0
11	UFF	0
12	UNAM	6
13	CEDERJ	7
14	RNP	0
15	CERN	0
16	LIP	0
17	SENAMHI	10
18	UC	16
19	REUNA	0
20	UDEC	5
21	RED.ES	0
22	UNLP	15
	SUM	126

- For these tasks, 126 Persons month = 5.3 EC funded FTEs
- 2.5 more FTEs unfounded

Final Considerations II

- Resources (for the first pilot):
  - CIEMAT (es): 50 nodes (100 CPUs) and 50 Tb.
  - UFRJ (br): 20 nodes (40 CPUs) and 1 Tb.
  - UFF (br): 16 nodes (16 CPUs) and 0 Tb.
  - Total: 86 nodes (156 CPUs) and 51 Tb.

Final Considerations III

- Quantitatively evaluation of second applications
  - Biomed: 1/6 SpecInt2000 per second per job, memory 1000 Mb and 0.002 Tb in disk and tape.
  - HEP: 1/6 SpecInt2000 per second per job, memory 1000 Mb and 0.002 Tb in disk and tape.
  - E-learning: To be evaluated
  - Climate applications: To be evaluated.

Thank you very much for your kind attention.