



E-infrastructure shared between Europe and Latin America

The EELA Project

presented by

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(on behalf of EELA management)

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www.eu-eela.org





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OUTLINE

- **The Goals**
- **The Consortium**
- **Budget and Human Resources**
- **The Structure**
- **Work Packages**
- **Summary and conclusions**



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OBJECTIVES

- **Main purposes:**

- Build a bridge between consolidated e-Infrastructure initiatives in Europe and emerging ones in Latin America
- Reinforce collaboration between Latin America and Europe

- **Objectives:**

- Establish a human collaboration network between Europe and Latin America:
 - Setting up the structure of the collaboration network
 - Establishing adequate support mechanisms
 - Adopting policies regarding the shared use of e-Infrastructure
 - Evaluating new areas of collaboration and relevant partners, both in Europe and Latin America



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OBJECTIVES

- Build a pilot e-Infrastructure in Latin America:
 - Implementing basic mechanisms for an interoperable e-Infrastructure, adopting a security policy, establishing Certification Authorities and defining basic tools middleware
 - Setting up a Pilot Testbed, establishing Virtual Organizations and supporting application developers and users
 - Supporting advanced network services
- Promote a sustainable framework for e-Science:
 - Identifying research communities and applications
 - Supporting dissemination efforts
 - Coordinating participation in possible new projects
 - Defining a map for a future consolidated e-Infrastructure in LA



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PARTNERS

— EUROPE

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

— INTERNATIONAL ORGANIZATIONS

- CERN
- CLARA

— LATIN AMERICA

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



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BUDGET

From 01.01.2006 to 31.12.2007

- Total Budget: 2568.32 K€
- **EC contribution:** **1700.00 K€**
- Special CIEMAT funds for LA: 400.00 K€
- Partners contribution: 468.32 K€



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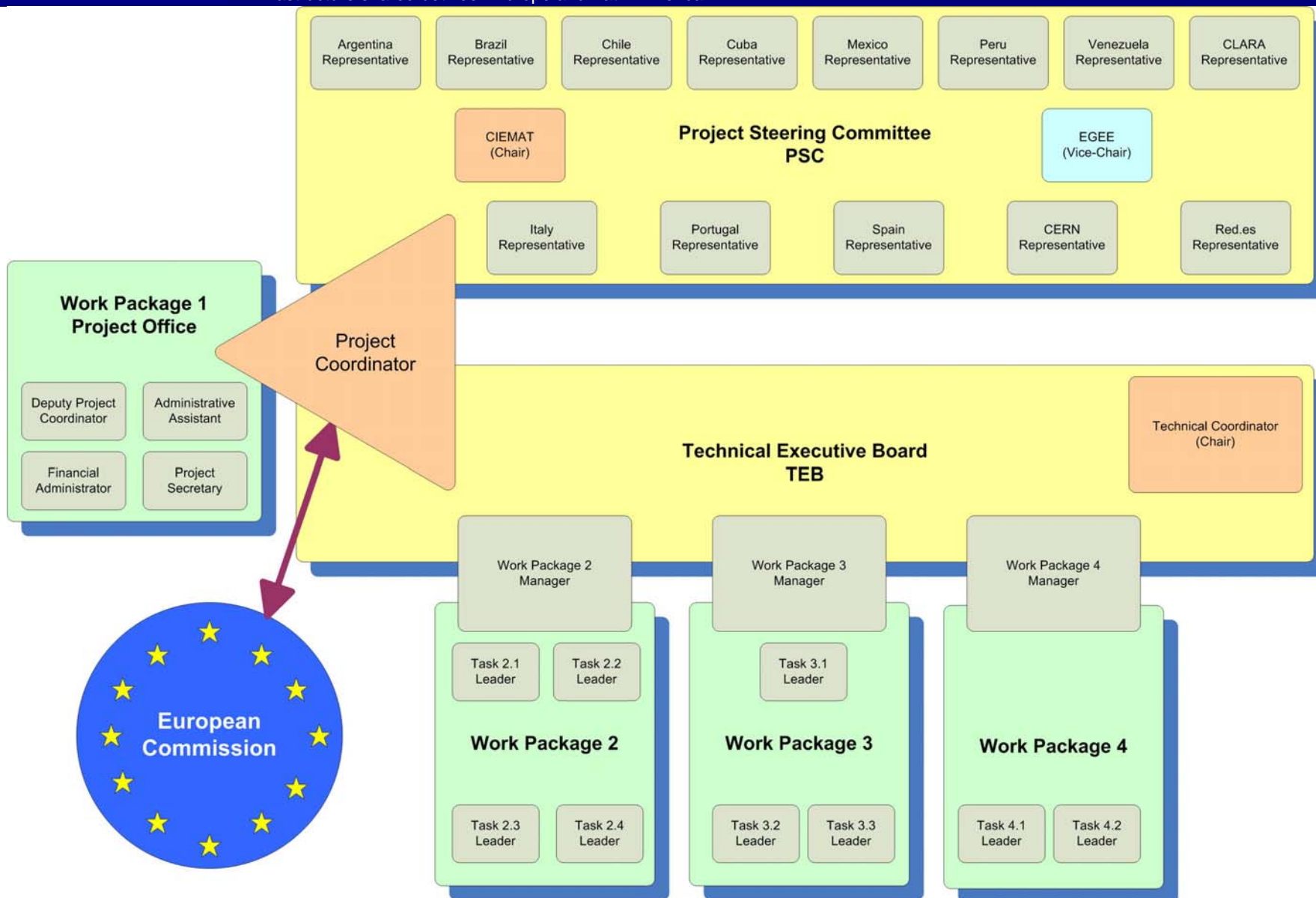
HUMAN RESOURCES

WP No	Work package title	Lead contractor	Person-months	Deliverable No
1	Project administrative and technical management	CIEMAT	29	7
2	Pilot Testbed Operation and Support	UFRJ	297	12
3	Identification and support of grid enhanced applications	CIEMAT	576	8
4	Dissemination activities	INFN	207	11
	TOTAL		1109	



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STRUCTURE



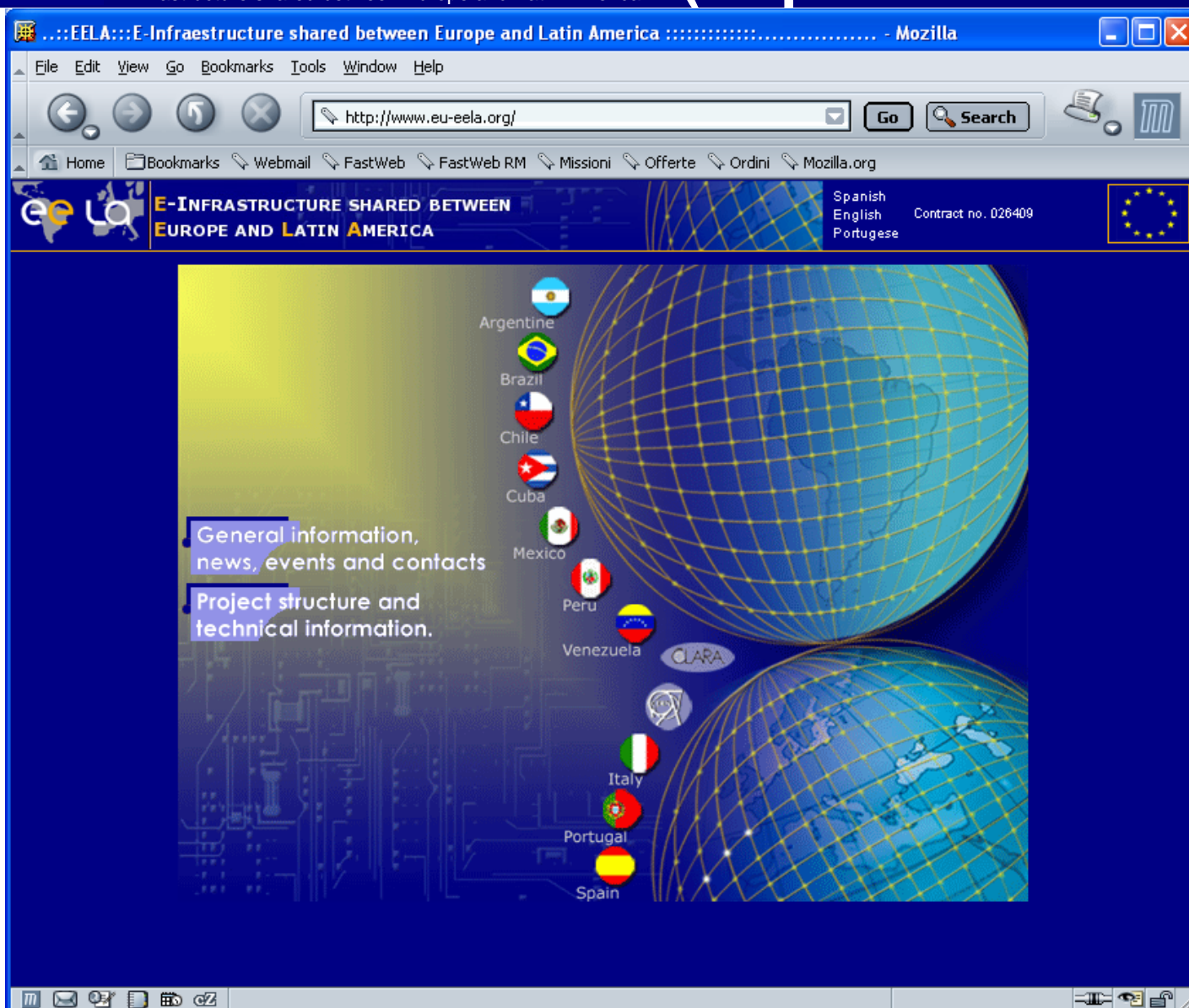


- **WP1: Project administrative and technical management**
 - **Manager: CIEMAT**
 - In charge of the financial and administrative parts of the project
 - Assisted by the legal advisor of CIEMAT
 - Elaborates technical documents, deliverables and reports
 - Interacts with EC
 - Takes care of the EELA Web Site
 - Distributes EC funds amongst the partners
 - Controls budget and audits



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The EELA web site (<http://www.eu-eela.org>)





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Work Package 1 Status

- **WP1:**
 - Contract Signature (20/12/2005)
 - Kick-Off Meeting (30/01 to 02/02/2006)
 - External Advisory Committee
 - Mailing lists
 - EELA Web Site running
 - Event agenda (INDICO)
 - Support System
 - Events Organization
 - Participation in Conferences, Workshops, etc.
 - EC Funds distribution among partners
 - MoUs with BELIEF, SEEGRID-2



- **WP2: Pilot testbed operation and support**
 - **Manager: UFRJ**
 - Establishes a common interoperable Pilot Grid Testbed between existing resources in Latin America and Europe
 - GÉANT, RedCLARA and European and Latin American NRENs will provide the network infrastructure
 - The grid infrastructure is based on the EGEE middleware framework
 - The EELA Pilot Testbed supports dissemination activities and application exploitation



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The EELA e-Infrastructure





- **Task 2.1 (Coordination of e-Infrastructure : Operation Management Team)**
 - Participants: UFRJ (Leader), CERN, CLARA, CIEMAT, CSIC, LIP, RED.ES, REUNA, UFF
 - Provides a coherent coordination amongst all WP2 tasks
 - Analyses prospective local Grid initiatives
 - Coordinates other Grid initiatives
- **Task 2.2: Certification Authorities and Virtual Organizations**
 - Participants: LIP (Leader), CERN, CSIC, RED.ES, REUNA, UFF
 - Deployment of Grid Certification Authorities in Latin America, accepted by the EUGridPMA
 - Implementation of Virtual Organizations
 - Support for dissemination and application users (HelpDesk, Portals,...)



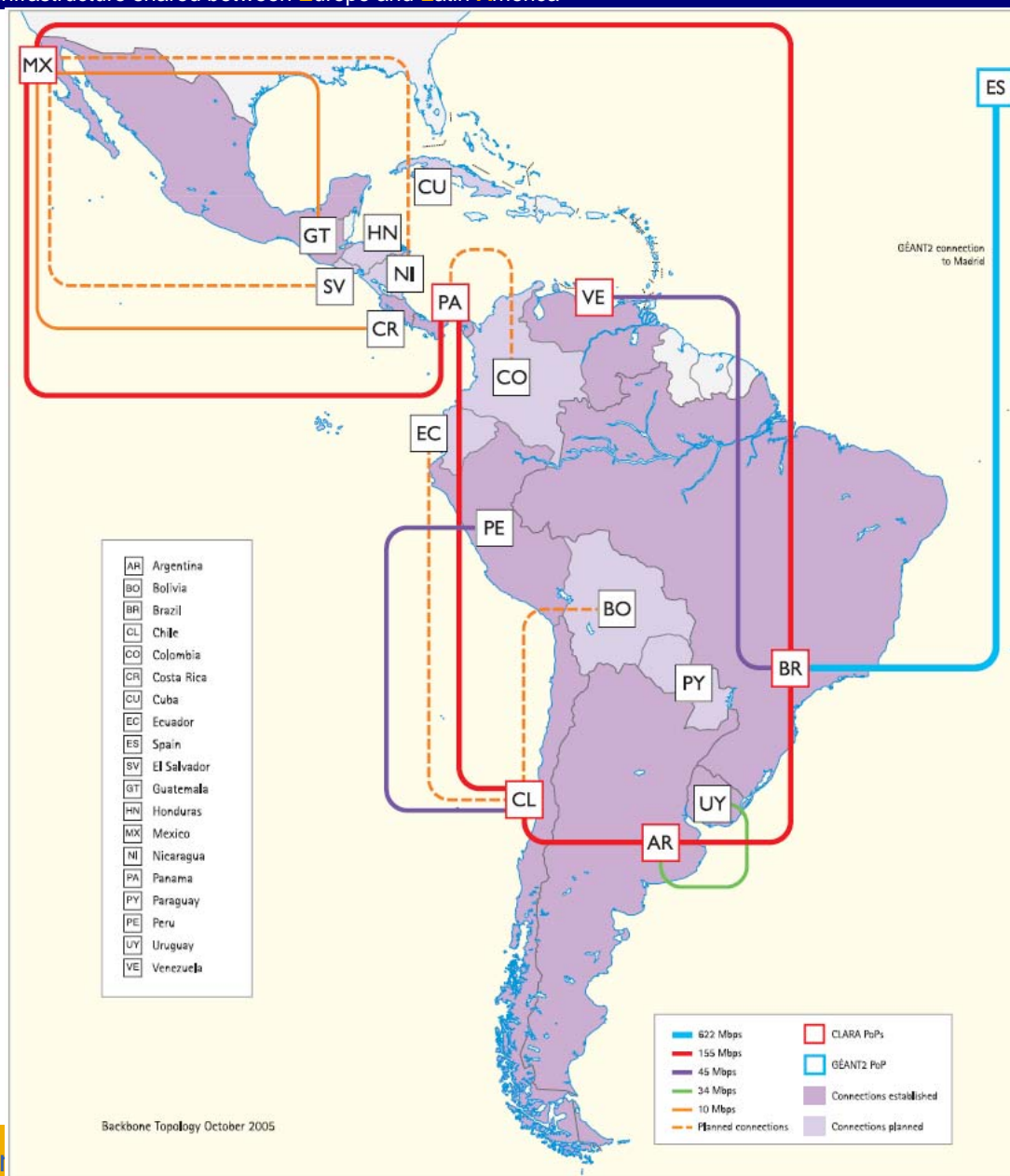
- **Task 2.3: Pilot Testbed Operations**
 - **Participants: UFRJ (Leader), CERN, CIEMAT, CSIC, LIP, REUNA, UFF**
 - **Supports the integration of CIEMAT, UFF, UFRJ and other sites in a Pilot Testbed interoperable with EGEE**
 - **Identifies new sites for integration in the Testbed**
- **Task 2.4: Network Support and Operation**
 - **Participants: CLARA, RED.ES, RNP (unfunded partner)**
 - **Continuous surveying and upgrading of network service offerings by RedCLARA and LA-NRENS**
 - **Definition of network services through standard modelling processes**
 - **Study of operational procedures at Network Operation Centre in CLARA**
 - **Introduction of the means for exercise of quality control of network services**
 - **Interactions with EGEE activities SA2 and JRA4 and with the Joint Research Programme of GEANT2**



The Network Infrastructure in L.A.

(<http://alice.dante.net>)

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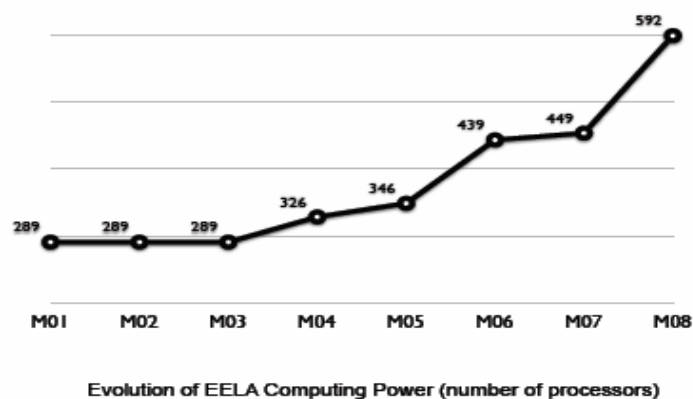
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WORK PACKAGE 2 Status

- GOC at UFRJ (BRAZIL)
- ROC at INFN/Catania (ITALY)
- EELA mini data challenges (Kick-Off Meeting - Madrid and EU-LAC Summit - Lisbon)
- 4 LA Certification Authorities accredited (Argentina, Brazil, Chile, Mexico)
- 2 VOMS servers deployed (LIP-PORTUGAL and UFRJ-BRAZIL)
- 7 Resource Centres integrated (the goal was 3 RC)
- 58% of the Committed Computing Power already available in 9 institutions



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EELA WP2 Current Achievements

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Milestone 2.3.1

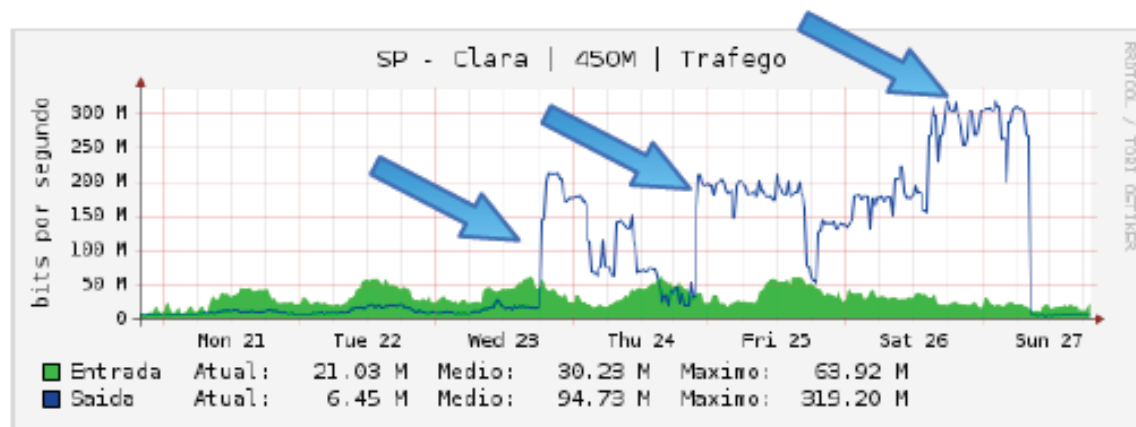
EELA Pilot infrastructure Operational (7 sites)



FP6-2004-Infrastructures-6-SSA-026409

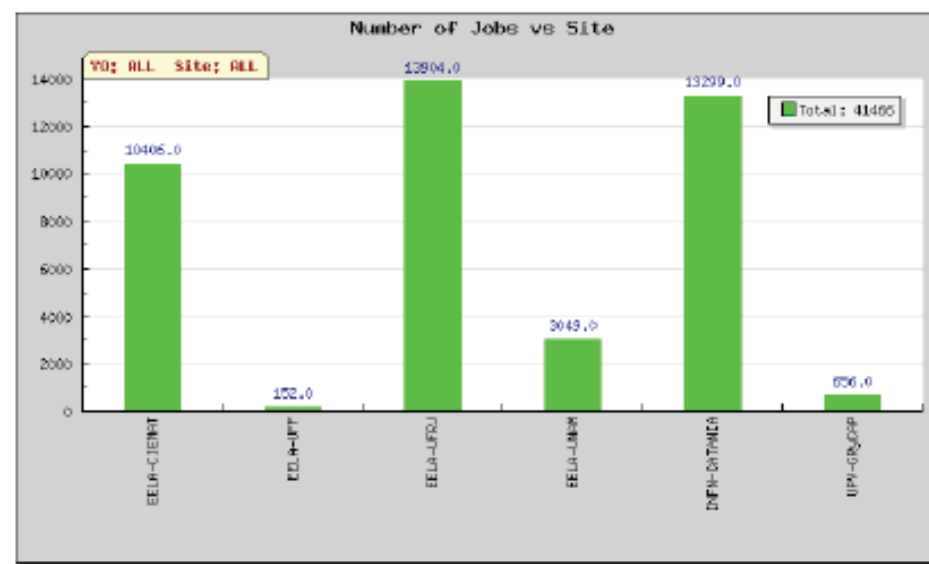
Santiago - Chile, 1st EELA Conference, 2008.08.04

Data and Services Challenges



BR -> SP tuning
Peak 319.2 Mbit/s
3 machines
1 stream per machine

~ 90% job efficiency
41466 jobs - 2 weeks
5 exclusive runs on EELA Sites





- **WP3: Identification and support of Grid enhanced applications**
 - **Manager: CIEMAT**
 - Identifies, selects and customizes relevant applications and tools suitable for the Grid dissemination process in Biomedical, High Energy Physics, Climate and e-Education
 - Contributes to the definition of a common application interface with other research fields to encourage and help scientific and technology communities to easily migrate their applications to the EELA e-Infrastructure

- **WP3 - Task 3.1: Biomedical Applications**
 - Participants: UPV (Leader), CUBAENERGIA, UFRJ
 - Deployment of pre-existing EGEE biomedical applications, like GATE (GEANT4 Application to Tomographic Emission), gPS@ (Grid Protein Sequence Analysis) and CDSS (Clinical Decision Support System on the grid)
 - Support for identification and migration of two Latin American applications
 - Integration of these new applications in the EGEE infrastructure



- **WP3 - Task 3.2: High Energy Physics Applications**
 - Participants: UNAM (Leader), UFRJ, UNLP, UTFSM
 - Running of Monte Carlo simulations for LHCb and ALICE experiments at LHC/CERN
 - Interactive analysis with specific middleware deployed on the EELA infrastructure



- **WP3 - Task 3.3: Additional Applications (Education in the Grid Environment)**
 - Participants: CEDERJ (Leader), CIEMAT, CUBAENERGIA, UNAM, UFRJ.
 - Provide access to remote laboratory work, using communication and control technology
 - Use of Grid Technology in the teaching process, including preparation of didactic material and digital libraries and repositories
 - Teach GRID technology to students in mainstream courses
 - Supply suitable applications to disseminate GRID technology in LA

- **WP3 - Task 3.3: Additional Applications (Climate in the Grid Environment)**
 - Participants: CEDERJ (Leader), UC, UDEC, SENAMHI
 - Migration of pre-existing data access/sharing tools appropriate to climate simulations and observations, focusing on El Niño phenomenon
 - Migration to GRID of data mining clustering algorithms that relate both climate simulations and local observations



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WORK PACKAGE 3 Status

■ BIOMEDICAL

- *GATE, WISDOM, BiG already deployed on EELA Infrastructure*
- *Phylogenesis foreseen*

■ HEP

- *ALICE and LHCb installed on the EELA infrastructure*
- *ATLAS, CMS and PIERRE AUGER Observatory willing to be integrated*

■ E-Learning (Identified candidates)

- *SATyrus, VoD-RemoteLab, ACADIA, ParallelInductive Logic Programming, LEMDist*

■ Climate (Identified Candidates)

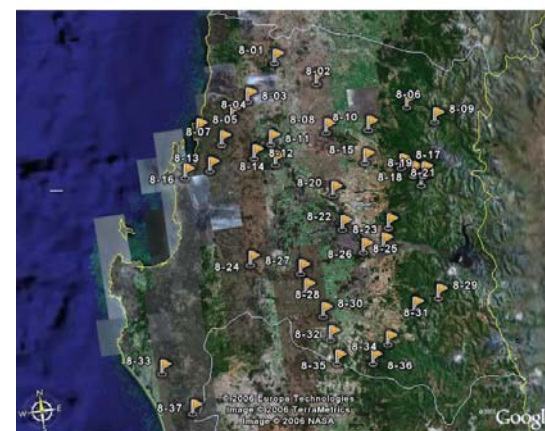
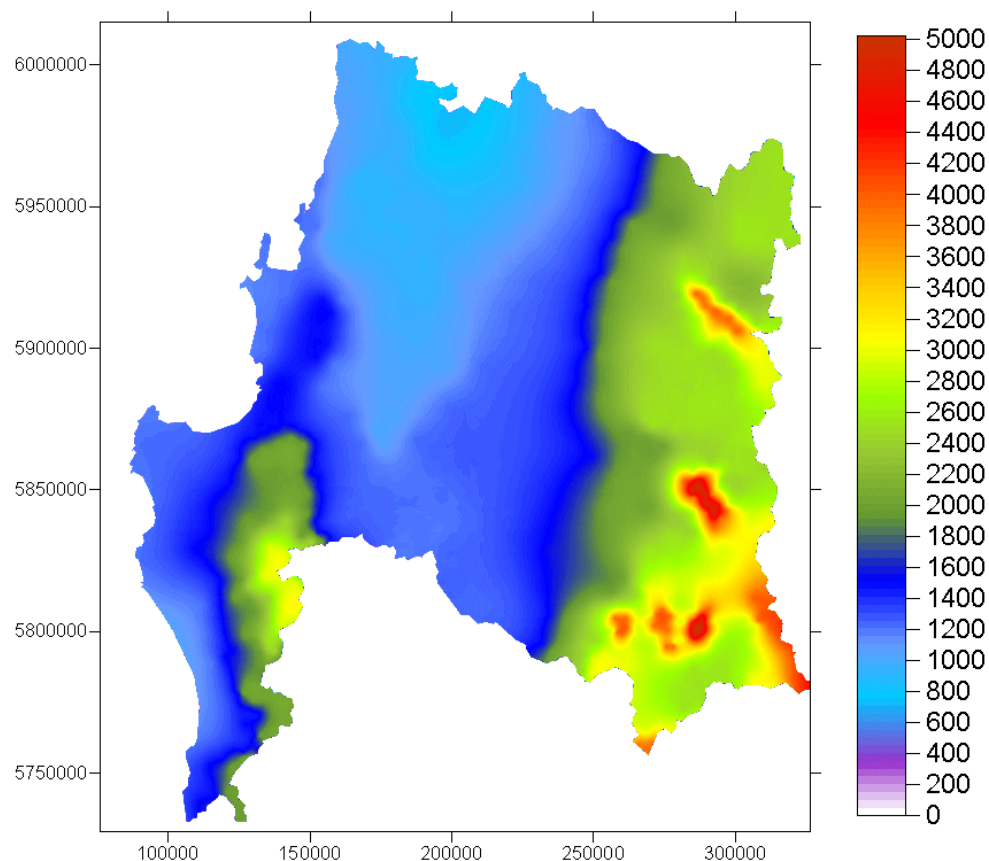
- *Global and Regional Climate Simulations*
- *Distributed access to Climate Datasets*
- *Development of Data Mining Applications*

- *BLAST in Grid (BiG)* is a Grid-enabled BLAST Interface.
- *BLAST (Basic Local Alignment Search Tool)* is a Bioinformatics Procedure Applied to Identify Compatible Protein and Nucleotide Sequences in Protein and DNA Databases.
- *BLAST* can be Applied, Among Other Uses, to Annotate the Estimated Function of Unknown Sequences.
- *BLAST* is Computationally Intensive.



CLIMATE

(SENAHMI, UNICAN, UDEC)





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EELA Applications: CAM

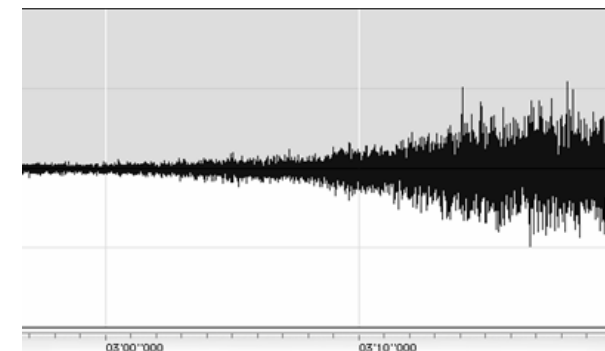
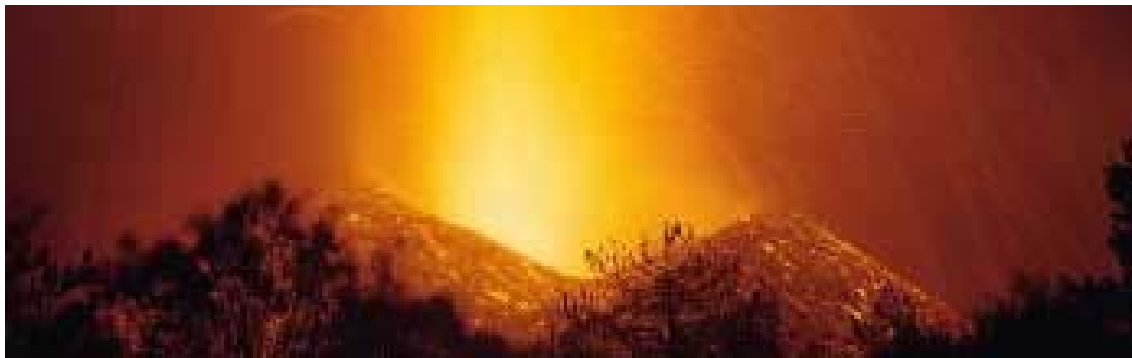
- Create a system of stationary analysis and prediction for the rain and the cycle of water (El Niño-La Niña phenomena)
- Plus humidity, basins of main rivers and their tributaries, lakes, etc
- Project also shared with other national and international institutions (France, UK) and projects
- Lots of data concerning monthly rainings from several institutions collected and corrected with their respective errors from 1990
- From 1992, these data are daily collected (rain, temperature, wind) from 128 weather stations
- Krigging Bayesian methods for the different regions for the prediction of basins, caudals and lakes capacities
- Dynamic prediction useful to be compared with traditional approaches
- Studies will be made for different phenomena with different timescale (day to century) in order to understand them locally and their influence in the studied processes
- Hope to understand slow or quick variations in the national climate (specially for high-risk situations)

e-Education Applications: VoD



EELA Applications: volcano eruption forecasting

- Currently no definitive method to predict the eruption of a volcano has been discovered or implemented (yet).
- Scientists monitor
 - seismic waves
 - number of earthquakes and the intensity of a specific type of quake (harmonic tremors) in the run up to eruptions.
 - changes in the shape of the volcano or concentrations of gases emitted from the cone.
- By correlating spectra and melodies with precise stages of volcanic activity we hope to discover a sort of “signature tune” of an imminent eruption or earthquake.
- By identifying musical patterns that warn of an eruption it would be possible to implement civil protection measures, days or even hours before the event





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WORK PACKAGE 4

- **WP4: Dissemination activities**
 - Manager: INFN
 - INFN GILDA as strategic tool, already used in EGEE
 - Introduce state of the art grid technologies and services to international community of users
 - Bring more LA and EU groups into EELA



- **WP4 - Task 4.1: Dissemination**

- Participants: CLARA (Leader), CIEMAT, CEDERJ, CUBAENERGIA, CSIC, INFN, RED.ES, SENAMHI, UDEC, ULA, UNAM, UNLP, UPV, UFTSM
- Provide general picture of EELA
- Disseminate the purposes and benefits of Grid computing and of joining or using the EELA Grid infrastructure
- Define the dissemination methods and message content for reaching each community
- Provide dissemination materials adapted to the target audiences and make them available
- Inform the scientific communities on how to get involved in the project
- Direct potential users so that they may become EELA users
- Keep the communities informed of new improvements and functionalities

- **WP4 - Task 4.2: Knowledge Dissemination**

- Participants: INFN (Leader), CERN, CSIC, ULA
- Provide a deep technical information to potential users
- Allow potential users to learn, practice and experiment, using GILDA
- Permit potential users to assess the power of the grid
- Prepare the necessary knowledge to enable new users to start using the grid in the best possible way
- Keep the users aware of new improvements and functionalities by means of well-suited tutorials
- Provide advanced training to experienced users and administrators
- Supply special knowledge to site administrators, VO managers, security contacts, developers and other technical personnel



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WORK PACKAGE 4 Status

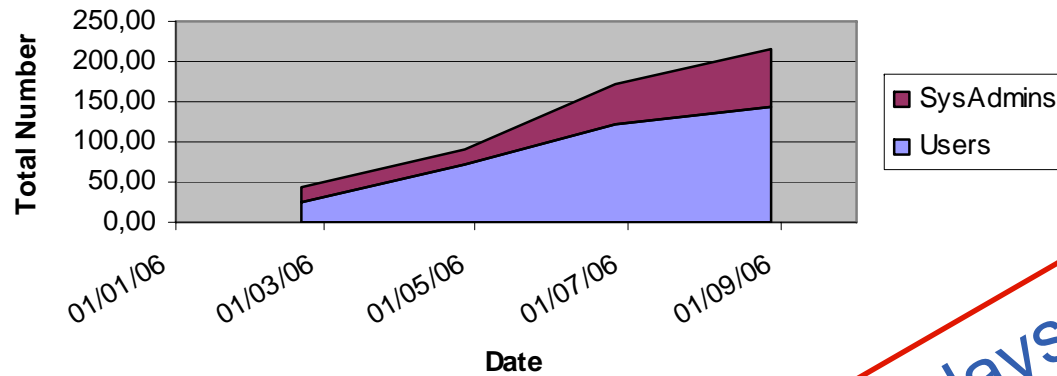
- EELA Questionnaire for New Communities (EELA WEB Site)
- DISSEMINATION: 2 brochures, 2 posters, 16 press releases
- 2 WORKSHOPS (Merida - Venezuela ; Itacuruçá - Brazil)
- 1 CONFERENCE (Santiago de Chile)
 - 138 participants from 16 countries
- 5 TUTORIALS
 - For users (total # of participants: 122)
 - *Merida - Venezuela (27-29 April 2006)*
 - *Santiago de Chile (6-7 September 2006)*
 - For users and system administrators (total # of participants: 49)
 - *Madrid - Spain (20-24 February 2006)*
 - *Itacuruçá - Brazil (26-30 June 2006)*
 - *Mexico City - Mexico (28 August - 01 September 2006)*



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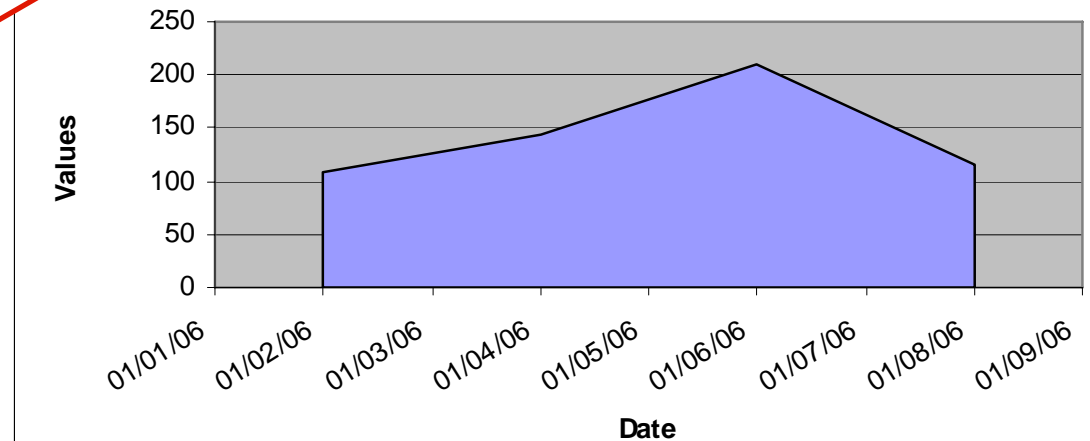
EELA Training Statistics

Tutorial participants



More than 575 participants-days delivered so far !

Participants x Days

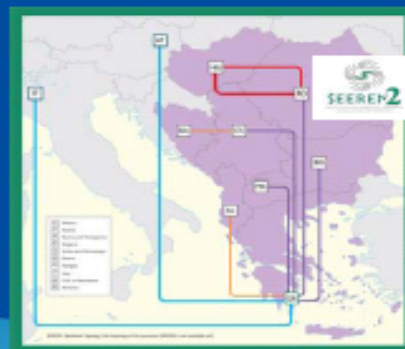
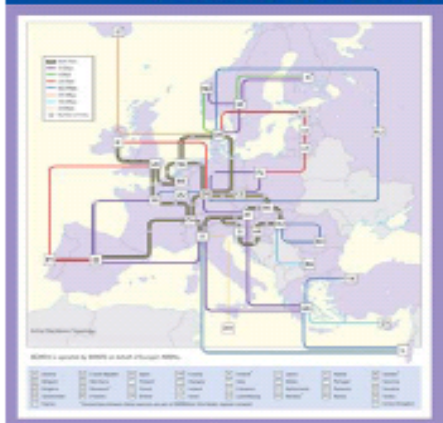




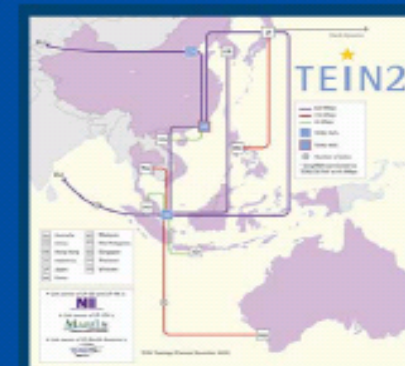
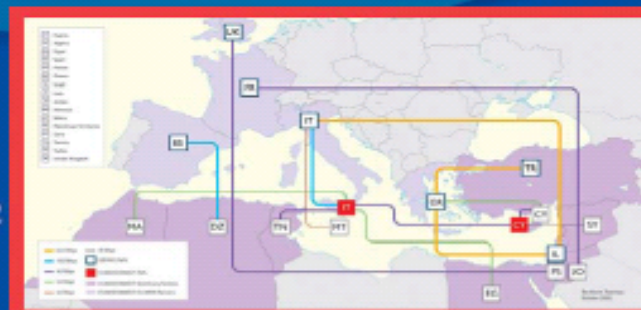
The “global” network coverage

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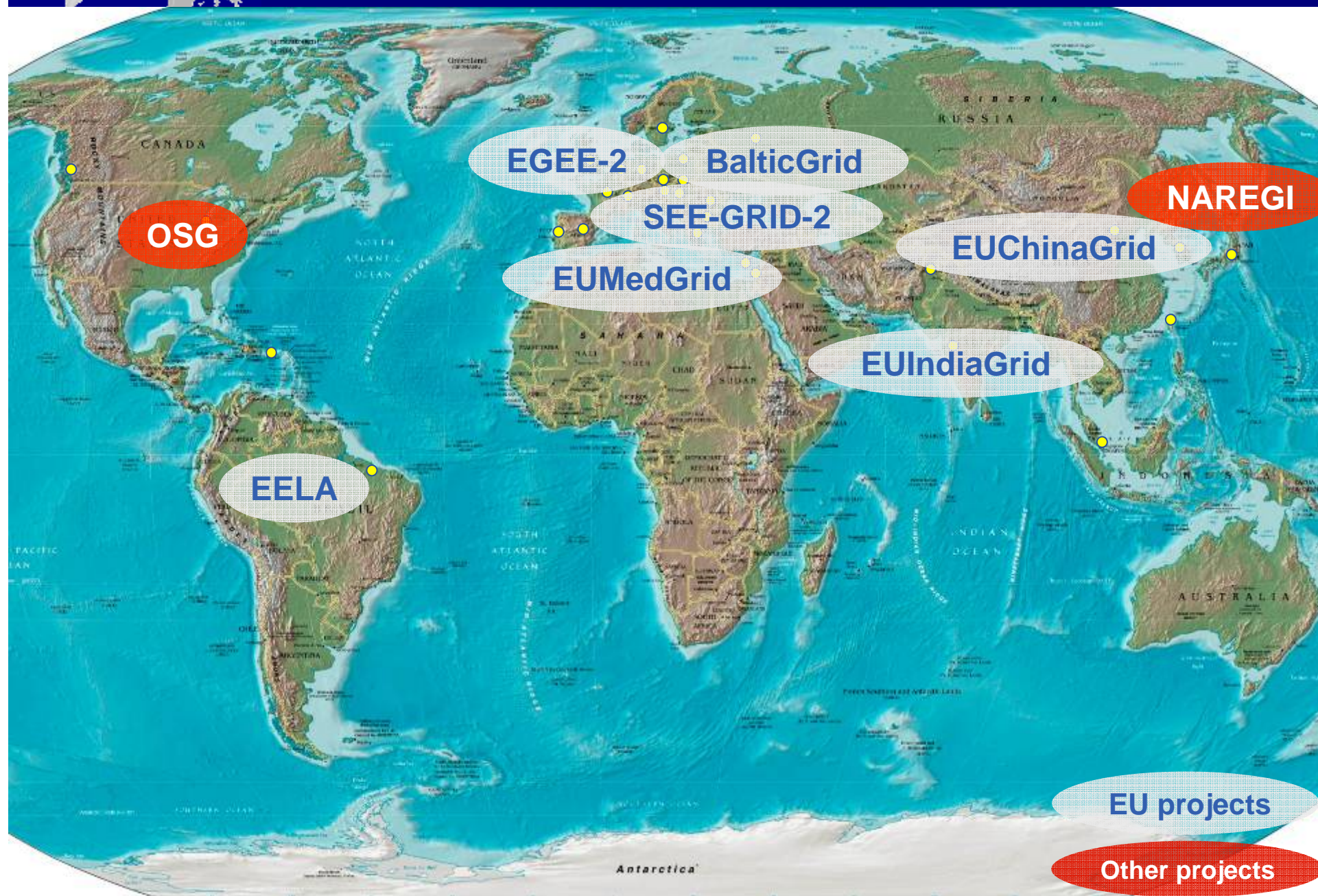
The Global Reach of European Research Networking



Design and production coordinated by DANTE on behalf of GEANT2
www.dante.net www.geant2.net



The “global” grid coverage





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Summary and Conclusions

- EELA is a concrete reality and represents the first step to bridge EU and LA in e-Science exploiting GEANT2 and RedCLARA networks and following the EGEE policies.
- The EELA workplan is very challenging but holds the promise to alleviate the digital divide in Latin America.
- EELA is a part of the global Grid and needs a robust collaboration with similar projects
- EELA is open to all interested project willing to collaborate. Let's use the conferences as a very good occasion to get together, discuss problems, and identify possible synergies.



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THANK YOU FOR YOUR ATTENDANCE