



E-science grid facility for
Europe and **L**atin **A**merica

Grid infrastructure for e-Science: a use case from Latin America and Europe

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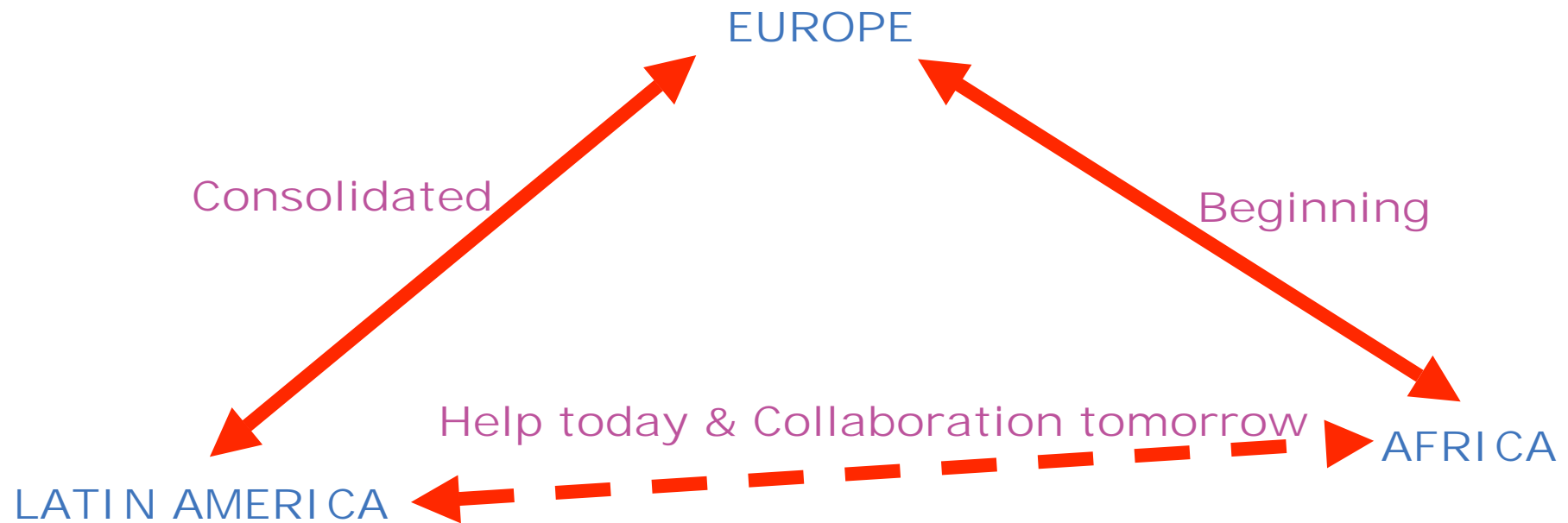


- **Why I am here?**
Improvement of Network Technologies
Grid in one slide
“Global” Networks and Grid coverage
Why Grid
EELA & EELA-2 objectives
Gestation and birth
Philosophy & characteristics
Countries and Resources Centres
Organisation
Survey of applications
EELA success stories
The bible
Recommendations and wishes



Why I am here?

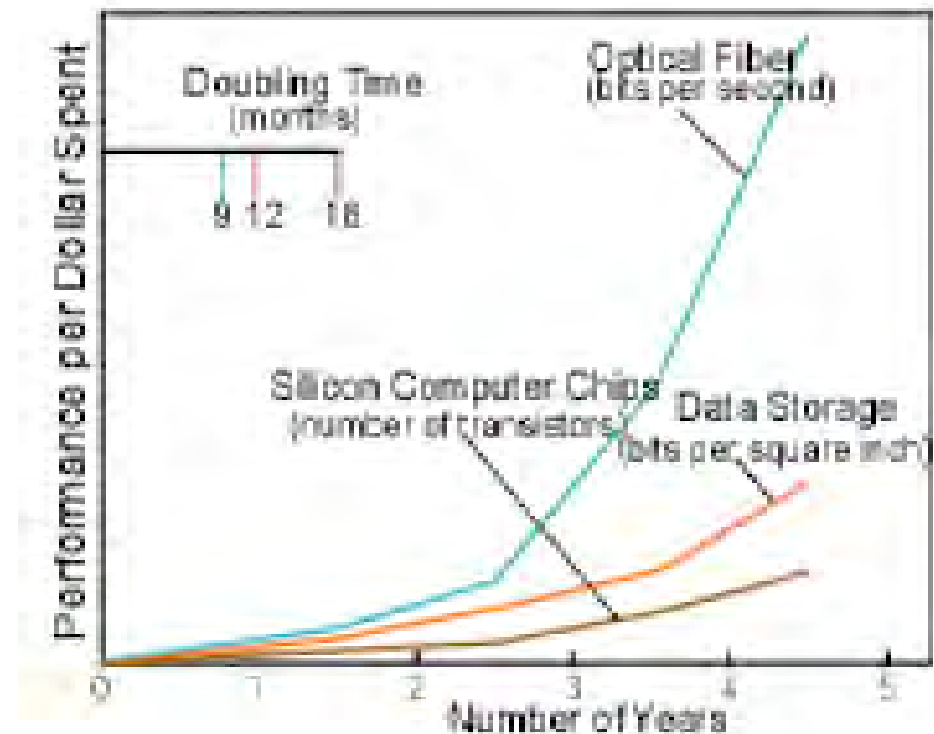
- **EELA (E-infrastructure shared between Europe and Latin America)**
Successfully boosted thank to a 2-year EC support
- **EELA-2 (E-science grid facility for Europe and Latin America)**
From Test-bed towards Production Quality





Improvement of Network Technologies

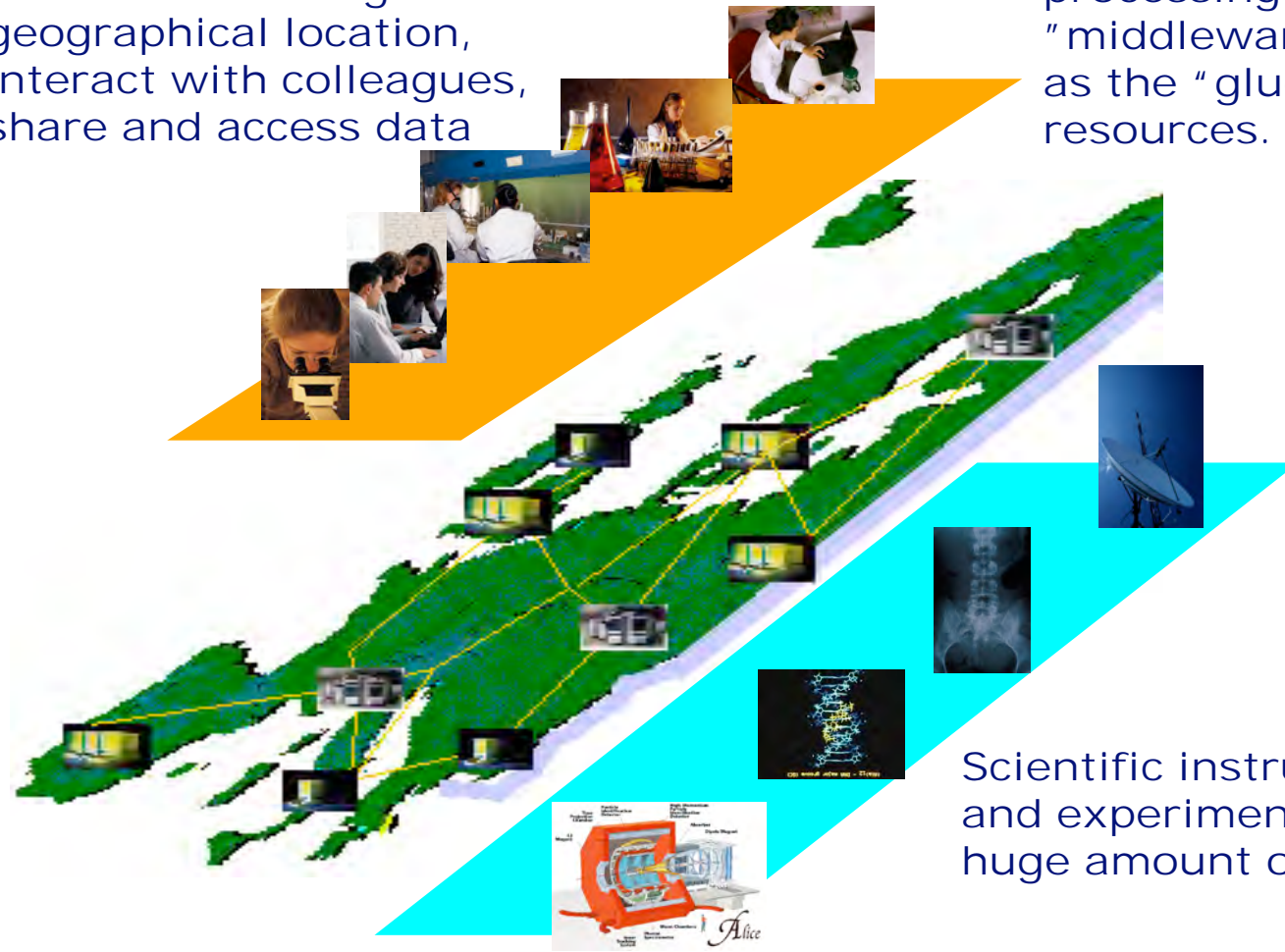
- **Network vs. Computer performances at constant cost:**
 - Computer speed doubles every 18 months
 - Data storage density doubles every 12 months
 - **Network speed doubles every 9 months**
- **1986 → 2000**
 - Computers: x500
 - **Networks: x340,000**
- **2001 → 2010**
 - Computers: x60
 - **Networks: x4,000**



Scientific American (Jan 2001) by Cleo Vilett; source: VinedKhoslan, Kleiner, Caufield and Perkins

Researchers perform their activities regardless geographical location, interact with colleagues, share and access data

The Grid: networked data processing centres and "middleware" software as the "glue" of resources.



Scientific instruments and experiments provide huge amount of data



The "global" Network coverage

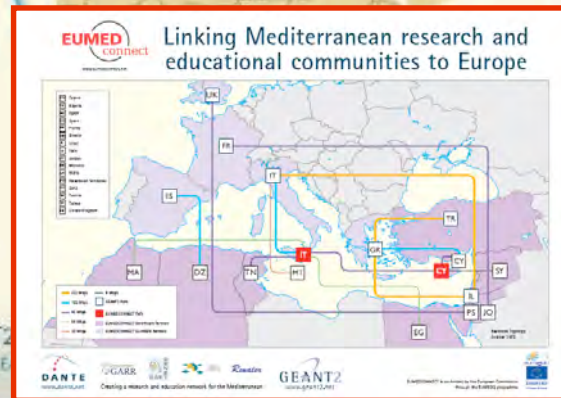
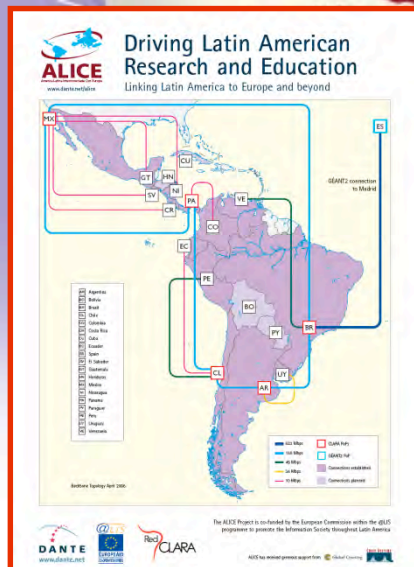
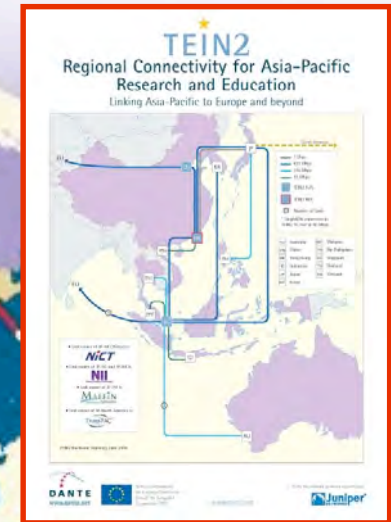
GEANT2

- GEANT2 Coverage
- ALICE-RedCLARA Network
- EUMEDCONNECT Network
- TEIN2 Network
- SEEREN2 Network

www.geant2.net

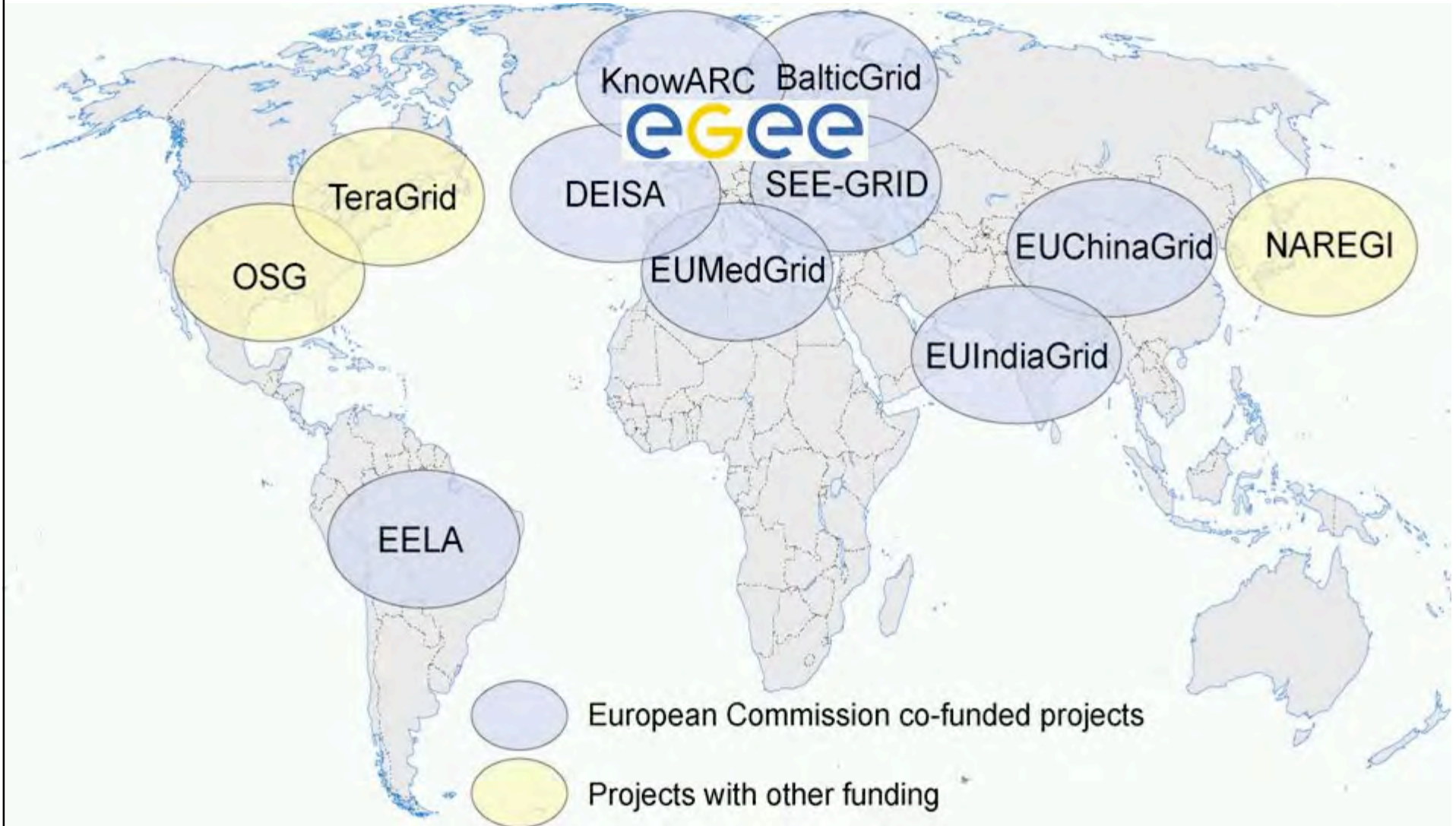


of Global Research Networking



★ Connect ★ Communicate ★ Collaborate







- If you need **huge** Computing Power and/or Data Storage
If **do not** have a supercomputer in your institution
If you have access to a “**reasonable**” network connection

Then Grid (Distributed Computing) could be a good solution

A good example: Looking for drugs against African or Latin American types of HIV?

No research in EU or USA!

Grid currently used in the Federal University of Rio de Janeiro (Brazil)



EELA & EELA-2 objectives

EELA (SSA project under FP6)

- Build a bridge between consolidated e-Infrastructure initiatives in Europe and emerging ones in Latin American
- Create a collaboration network to deploy a large portfolio of scientific applications on a well supported Pilot Test-bed
- Care in parallel of the training in grid technologies and of the knowledge dissemination and outreach

EELA-2 (I³ project under FP7)

- Provide an empowered Grid Facility with versatile services fulfilling application requirements
- Ensure production quality services
- Ensure the long term sustainability of the e-Infrastructure beyond the term of the project
- Expand the current EELA e-Infrastructure
- Look for new communities outside academia (Industry and Business)



EELA-2 gestation and birth

– **FP7 call:**

INFRA-2007-1.2.3 (e-Science Grid Infrastructures)

EELA-2 proposal submitted to EC on 20/09/07

Successful Hearings on 22/10/07

Negotiation started on 20/11/07

Grant Agreement signed by EC on 19/05/08

Starting date: 1st April 2008



Philosophy & characteristics - 1

- **e-Infrastructure oriented Project**

Applications oriented e-Infrastructure

Production quality e-Infrastructure

Consortium: 81 candidates

54 Members were selected (1 withdrawal)

If more than one member in country:

The **Members** federate into a **JRU**

One of the **Members** becomes a **Partner** that will adhere to the Contract

EELA-2 “seen” by EC: 16 Partners



Philosophy & characteristics - 2

- **Challenge: how to cope with 53 members and ~ 50 applications?**

EELA-2 Support Teams for applications:

Gridification, Deployment and Production Teams (partially funded)

Application Teams (one per application - unfunded)

Looking for communities outside academia (business and industry)

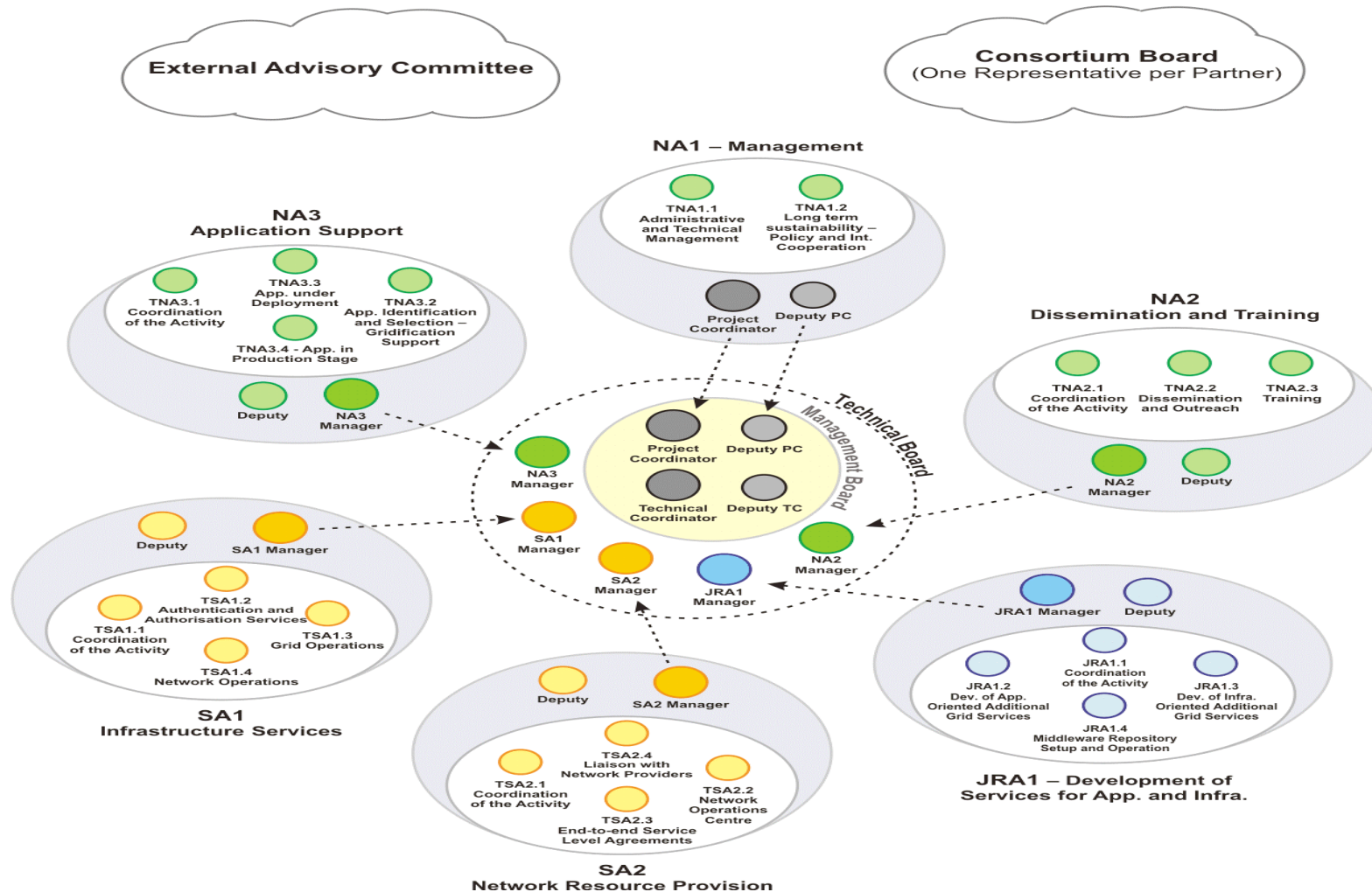


Countries and resources centres



- 14 Countries
- 16 Partners (9 JRUs)
- 53 Members

New Management Board & External Project Office



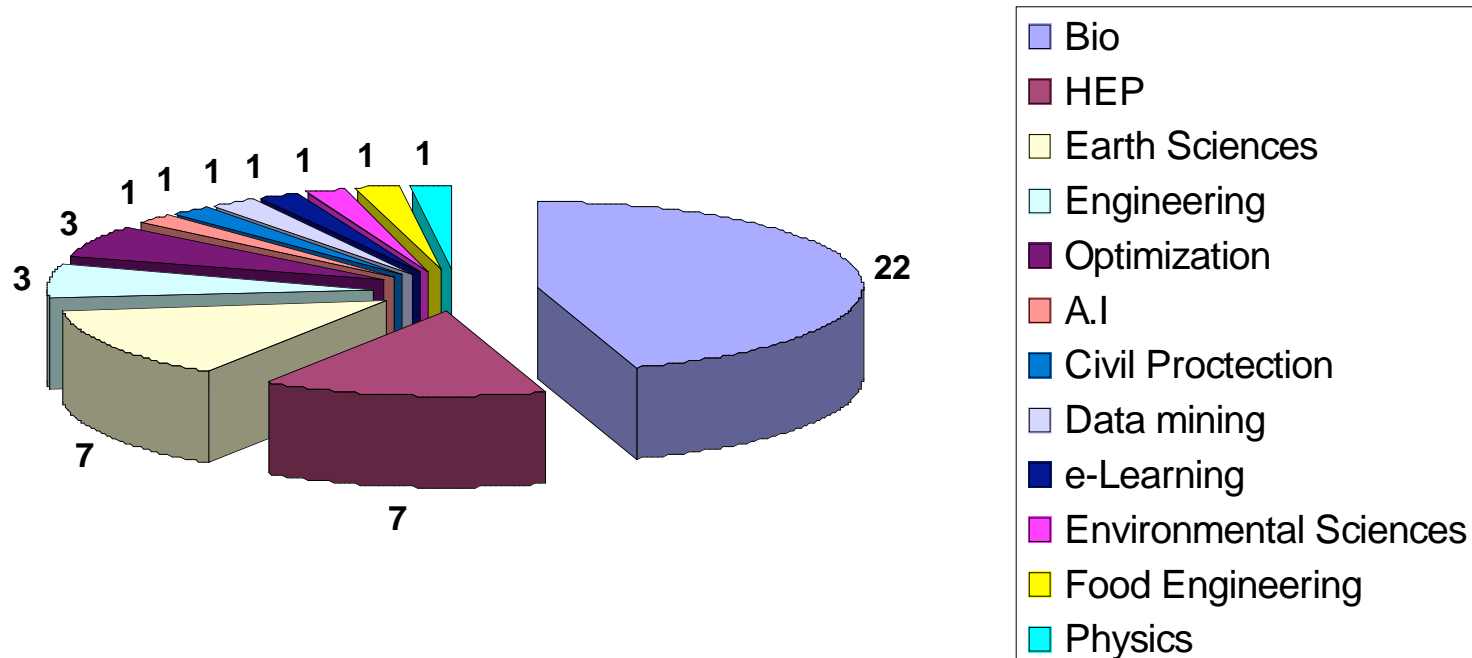


SURVEY: APPLICATION DOMAINS

Biomedicine: 45%

HEP: 14%

Earth Sciences: 14%





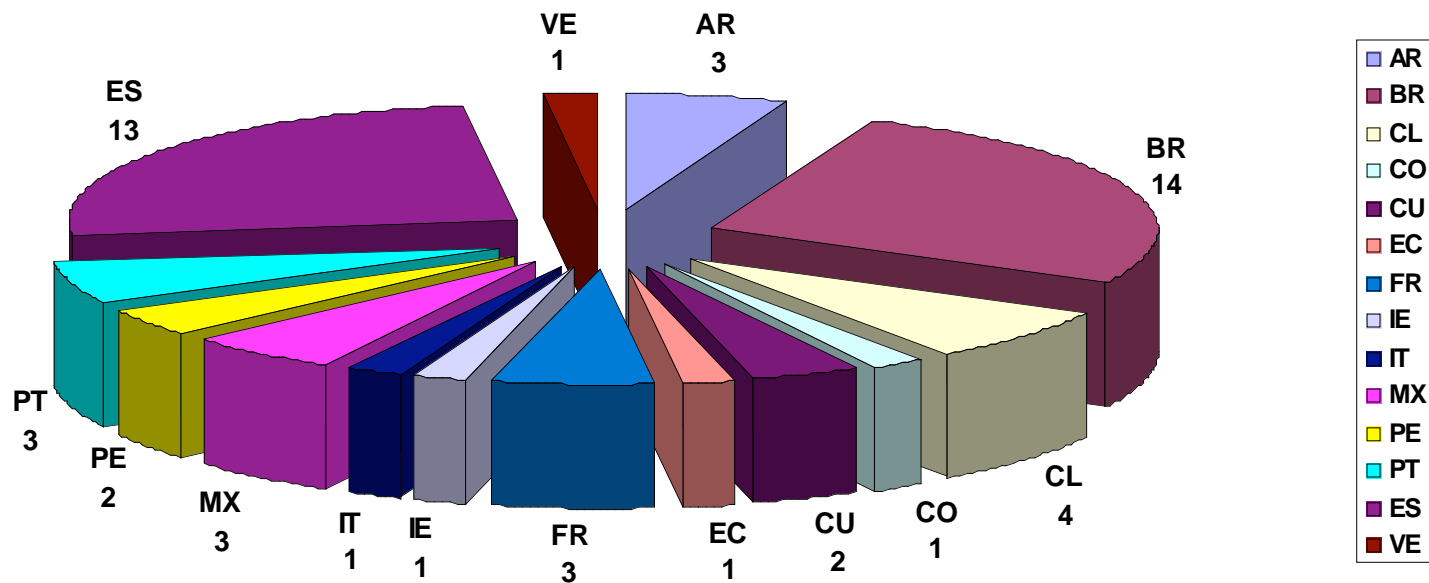
SURVEY: APPLICATIONS / COUNTRY

BR: 29%

ES: 27%

CL: 8%

AR=FR=MX=PT: 6%



- **Problem Addressed**

- WISDOM (Wide In-Silico Docking Of Malaria) is a deployment of a high-throughput virtual screening platform in the perspective of in-silico drug discovery for neglected diseases
- The in-silico docking is faster and much cheaper than the experimental docking, which is restricted to the most successful ligands obtained after the simulation process

- **Latin American Interest**

- Collaboration is started in the analysis of **new targets for malaria**. New targets of Plasmodium Vivax have been included in large-scale docking experiments





(Some) EELA success stories - 2

Goal: Predict Local Impacts of “El Niño” and “La Niña” in Latin America. A challenging problem for the climate community with huge socio-economical impact.

The image displays a world map with a grid overlay, focusing on Latin America. A zoomed-in map of South America shows a color-coded precipitation anomaly, with red and yellow indicating positive anomalies and blue indicating negative anomalies. Below the maps is a screenshot of a web-based climate model interface, showing a table of simulation results and a sidebar with navigation options.

Case Name	Status	Start Time	End Time	URL
Peru3	Running	16:10:39		https://rb-eela.cimat.es:9000/6CHP
Peru2	Aborted	2007-02-22 16:07:36		https://rb-eela.cimat.es:9000/5Rpsl
Peru	Done(Success)	2007-02-22 15:48:07		https://rb-eela.cimat.es:9000/Rgxcl
concepcion	Done(Success)	2007-02-22 11:28:31		https://rb-eela.cimat.es:9000/GVuC
ConcepcionFloodings	Done(Success)	2007-02-22 11:09:54		https://rb-eela.cimat.es:9000/LzVD
kyrill_GB2	Done(Success)	2007-02-22 10:01:30		https://rb-eela.cimat.es:9000/j81O

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Description of Work - DoW

<http://documents.eu-eela.org/record/1086/files/>



**WEBSITE (EELA-2 & EELA): access to
INDICO (Events) and INVENIO (Documents)**

www.eu-eela.eu

WIKIs for more technical information

FRAMEWORK PROGRAMME 7

cordis.europa.eu/fp7



Recommendations and wishes

- No EELA-3 foreseen



“**Long-term sustainability**” should be an EELA-2 goal

National Grid Initiatives (NGI) should be created

e-Science structures highly desirable

New Communities using the EELA-2 e-Infrastructure

New Countries collaborating with / joining EELA-2:

why not some from Africa?

No GRID without (good) Networks: collaborate!!!



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