



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

Grid Infrastructure in Latin America EELA-2 and its daughter GISELA

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EELA-2 & GISELA Project Coordinator

CETA-CIEMAT (Trujillo - Spain) & UFRJ (Rio de Janeiro - Brazil)

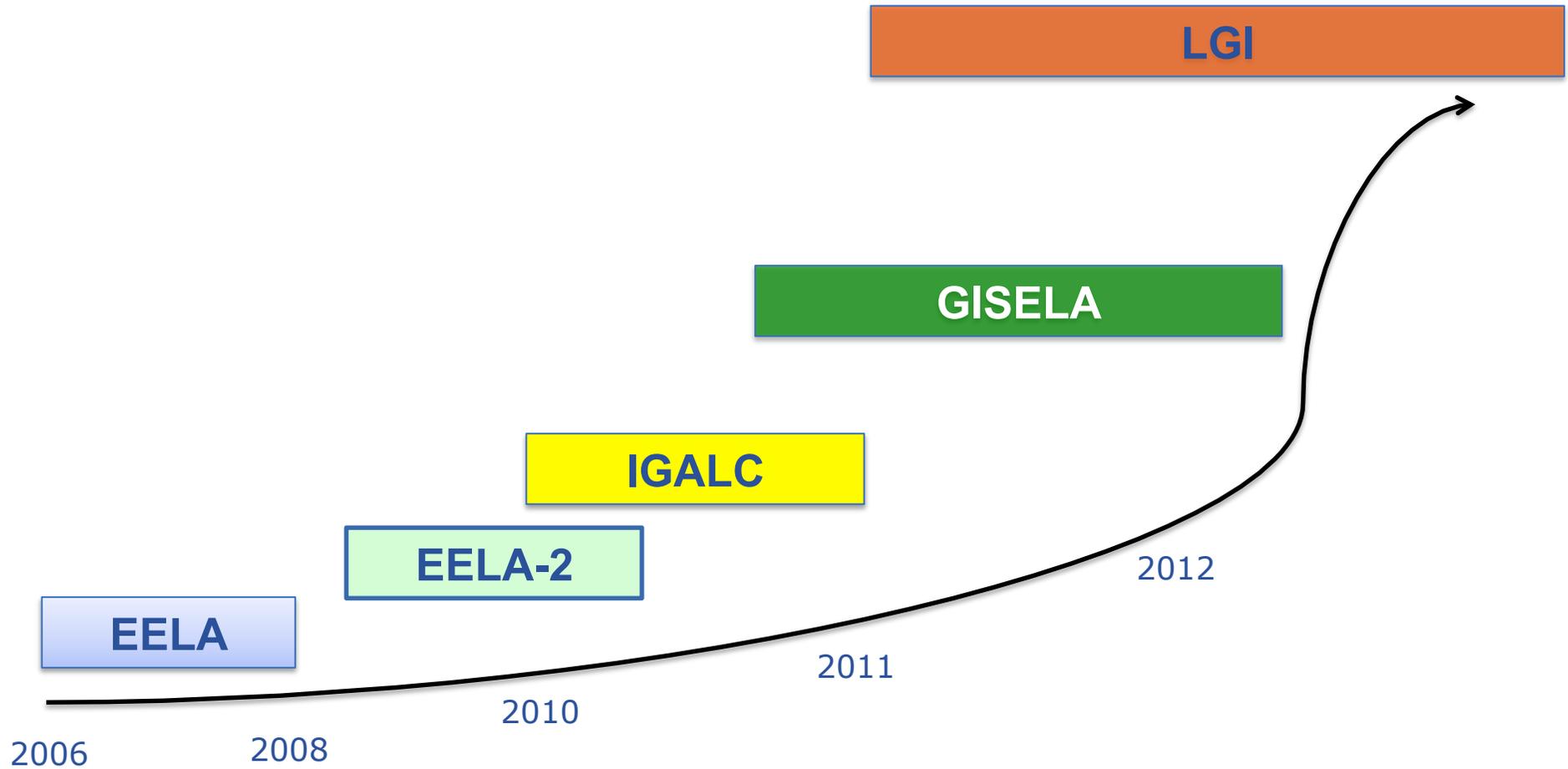
IBERGRID' 2010 Conference – 24 to 27 May 2010

Braga – Portugal





Flying avoiding ... volcanoes





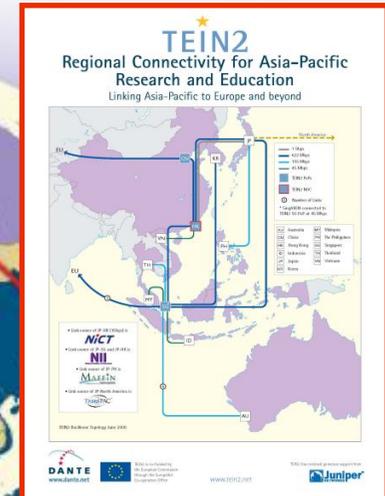
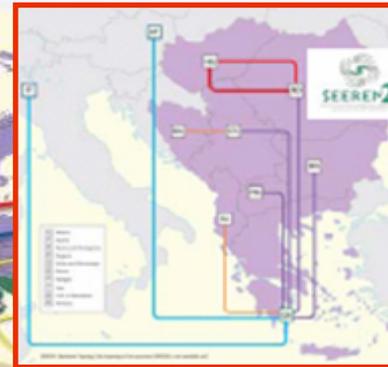
- **Networks & Grid coverage**
- **EELA-2 objectives and outcomes**
- **The GISELA project: e-infrastructure & support to VRCs**



The "Global" Network Coverage

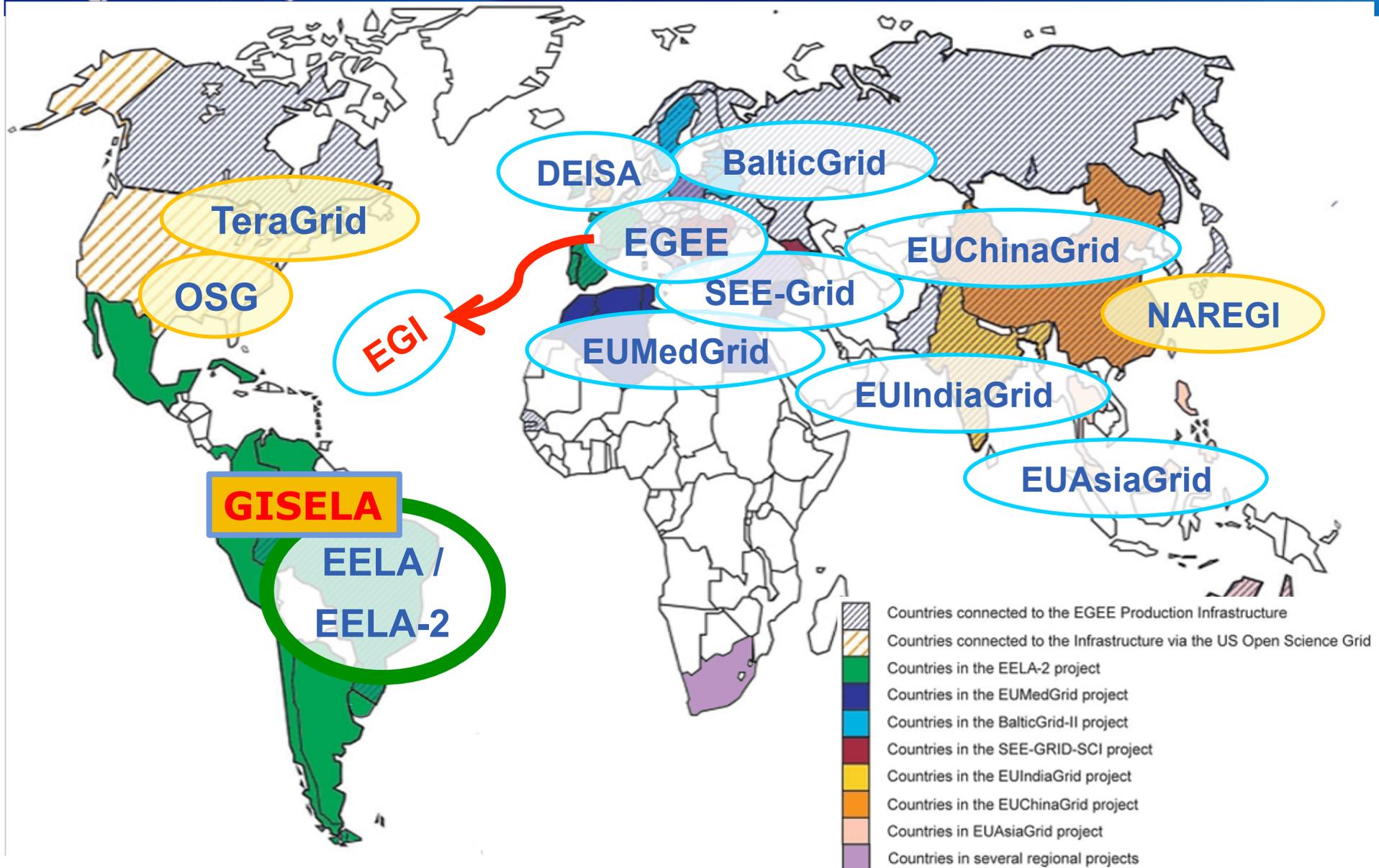


of Global Research Networking



★ Connect ★ Communicate ★ Collaborate







EELA & EELA-2 objectives

EELA (Jan. 2006 – Dec. 2007)

- **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 (Apr. 2008 – March. 2010)

- **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)**



Projects in numbers

EELA (SSA under EU FP6)

E-infrastructure shared between Europe and Latin America

- EC support: 1.7 M€
- **CIEMAT extra support: 0.4 M€**
- 10 Countries (3 in Europe)
- 2 International Organisations
- 20 Members (13 in Latin America)

At the final review EELA was awarded the highest EC rank: "Good to excellent project"

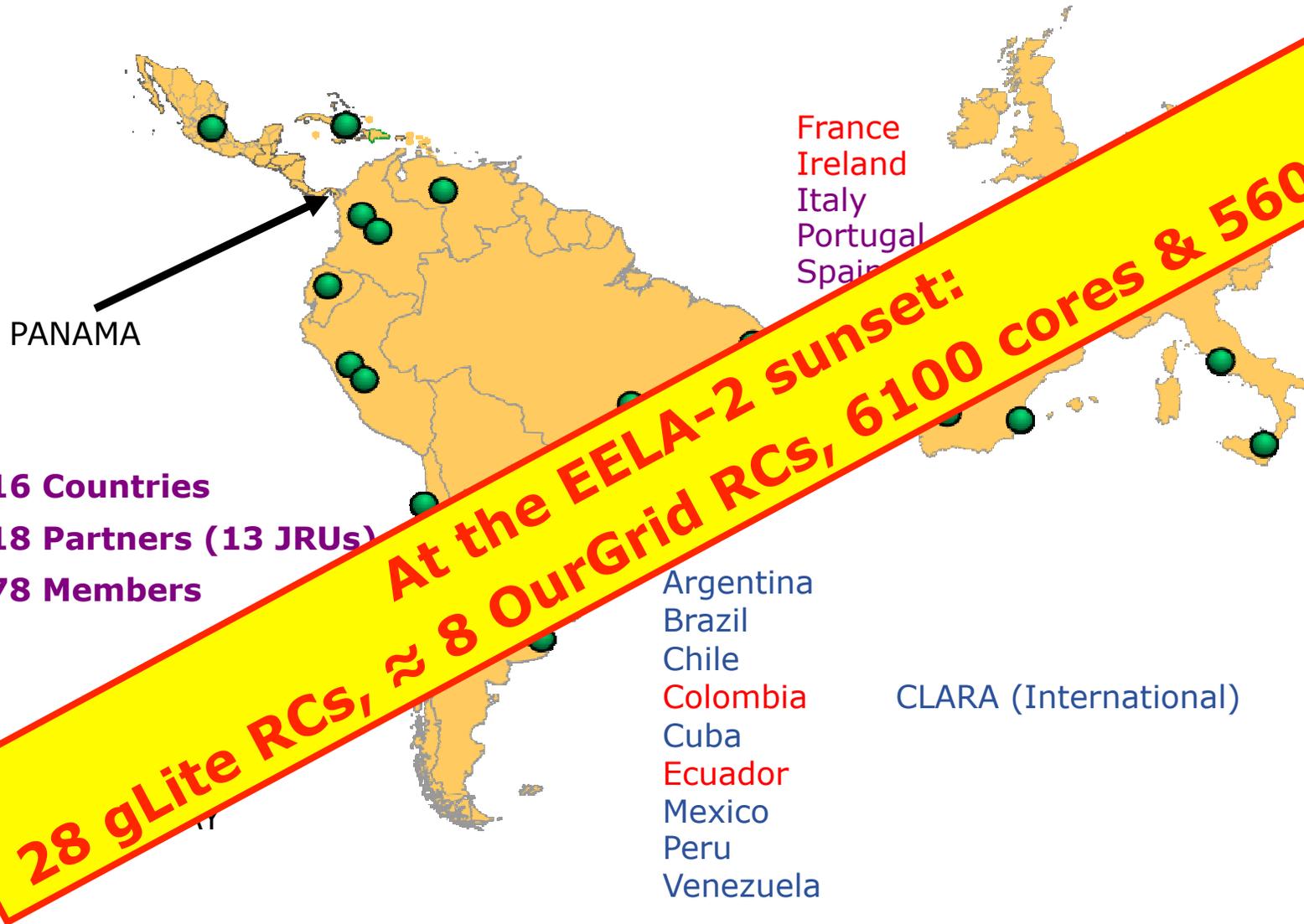
EELA-2 (CP-CSA under EU FP7)

E-science grid facility for Europe and Latin America

- EC support: 2.1 M€
- **CETA-CIEMAT extra funds: 0.3 M€**
- Currently 16 Countries (11 in LA)
- **2 new countries (Panama & Uruguay)**
- 1 International Organisation (CLARA)
- **Currently 78 Members (62 in LA)**
- 32 Institutions joining (31 in LA)
- **Currently 13 JRUs (9 in LA)**
- **4 new JRUs (3 in LA)**



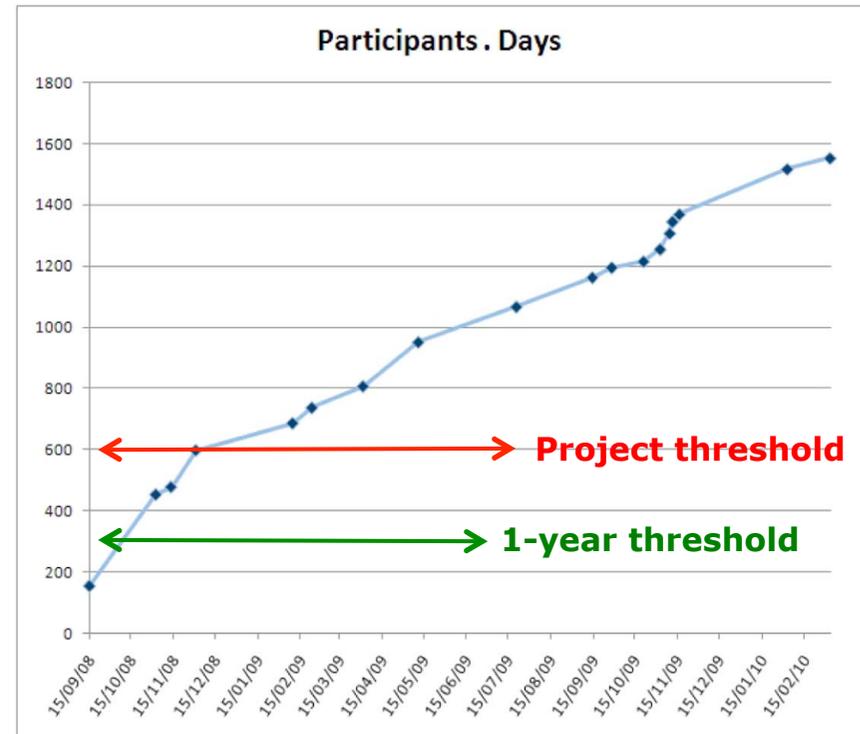
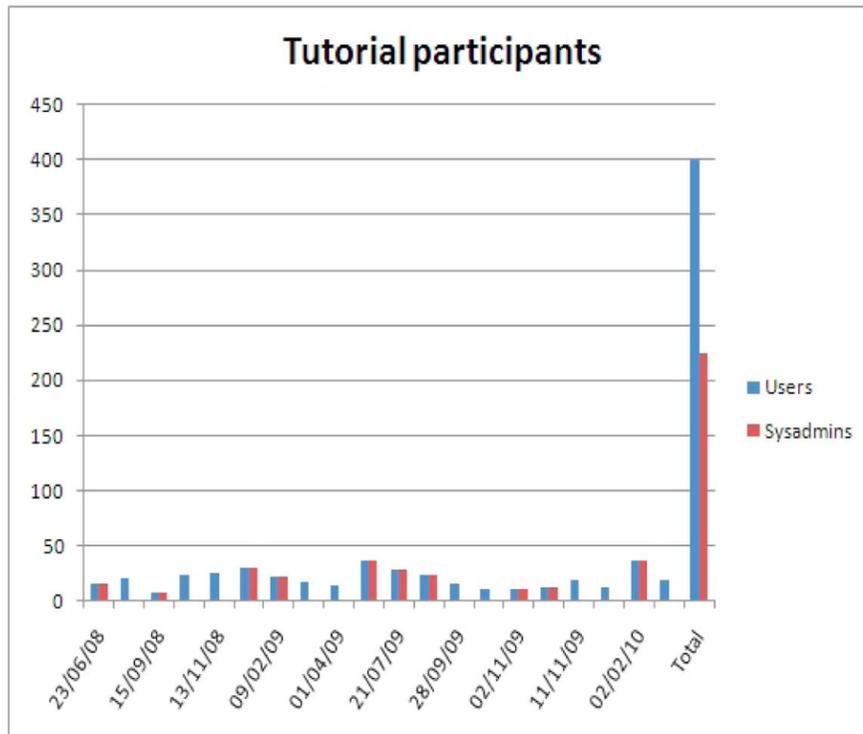
EELA-2 Countries / Resources





NA2 = Dissemination & Training

Much more training effort delivered than pledged



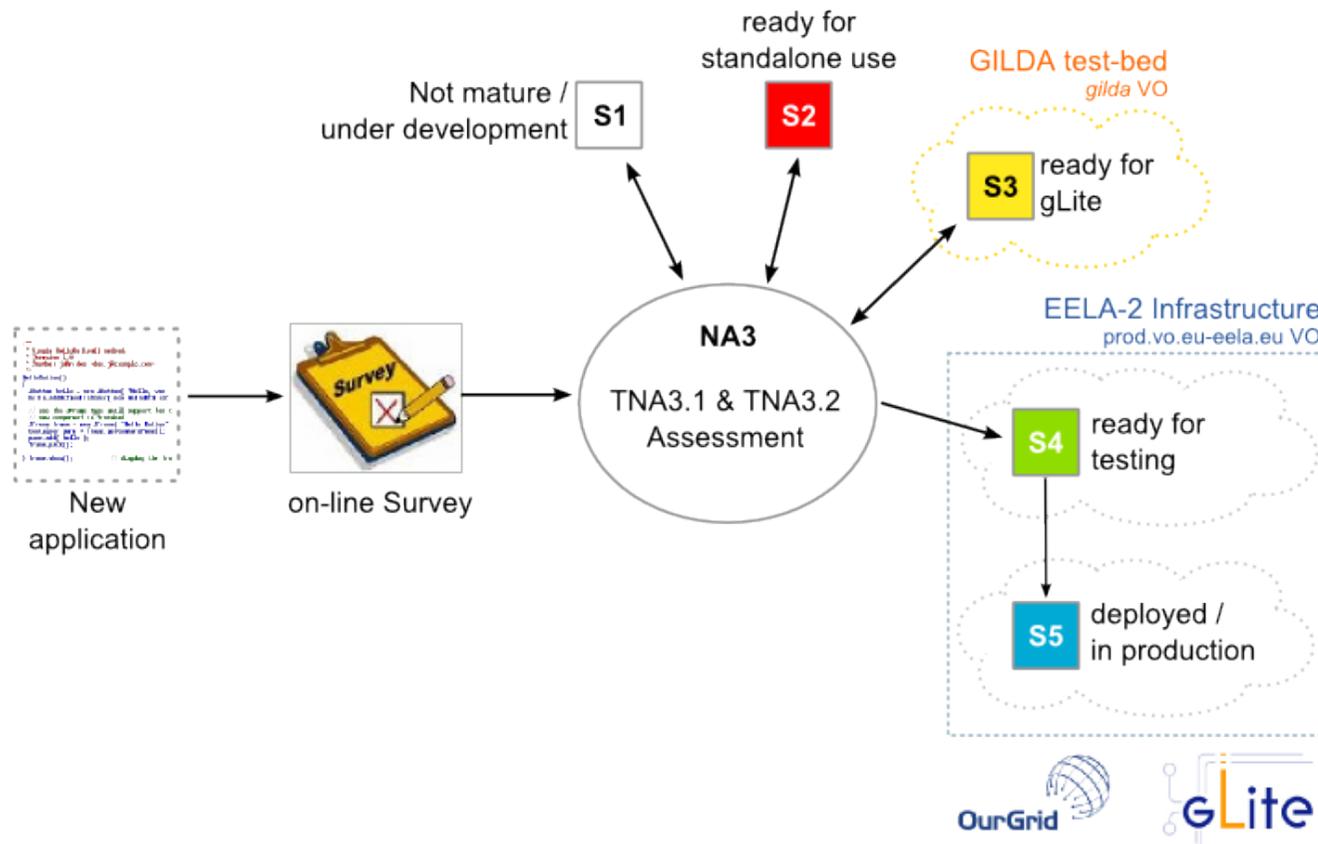


EELA-2 Applications Selection

Relevant and strategic applications that have been selected through a strict, although open, procedure from a large portfolio. The actual assessment of applications was based taking into consideration the following criteria

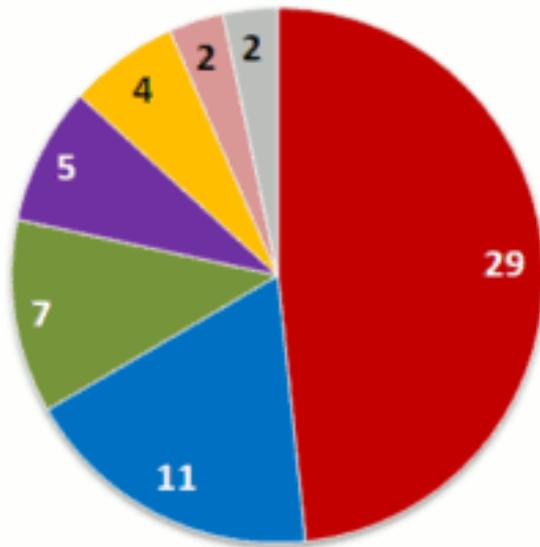
- Number of involved institutions from Europe and Latin America
- Suitability for Grid deployment
- Easiness of *gridification*
- Grid added value
- Resources (CPU, storage) commitments of the Institutions involved
- Usage of the infrastructure (number of jobs and frequency of runs)
- Potential outreach / impact (in the scientific community, industry, socially in the country, towards policy / decision makers)

In order to foster even more the collaboration between European Institutions and Latin American ones, applications involving partners from both continents were preferred



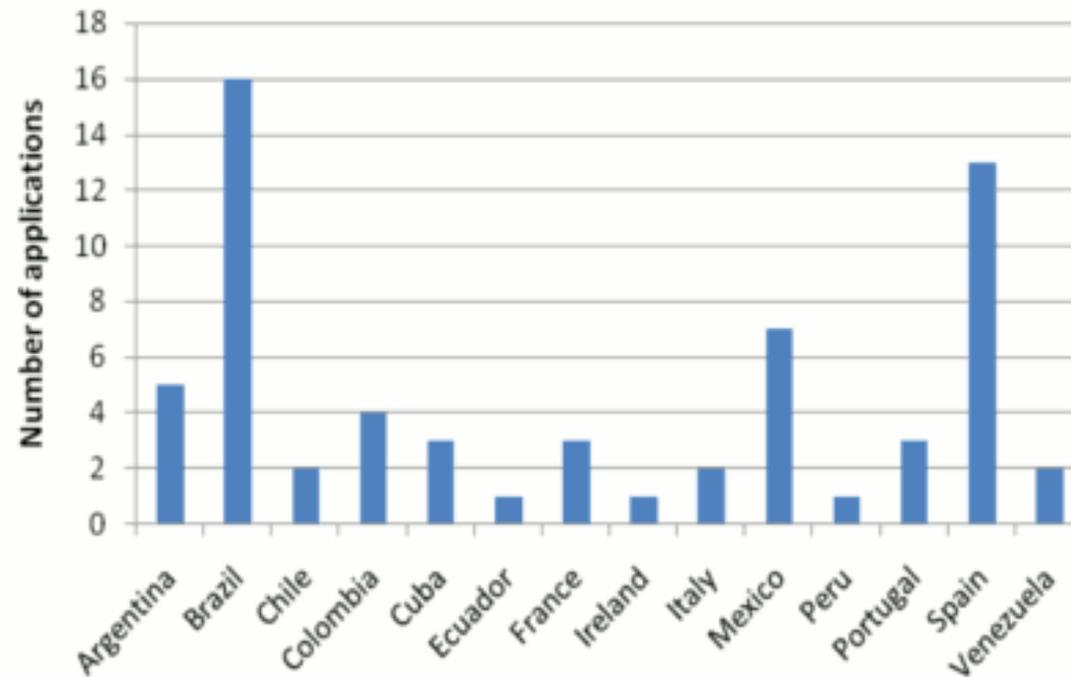
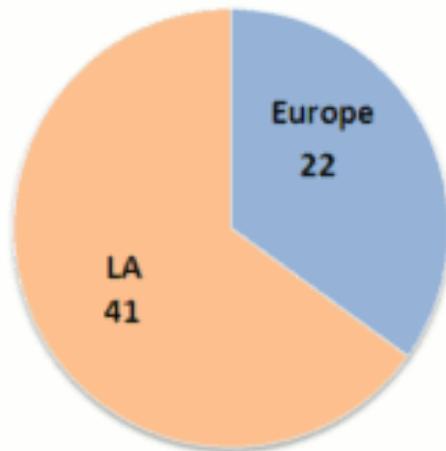
Grid Schools, Gridification Weeks, User Forums, User Guides, Tutorials, FAQs, etc. helped a lot!

Currently: 61 Applications



Scientific Domain

- Life Sciences
- Earth Sciences
- Engineering
- HEP
- Computer Science and Mathematics
- Computational Chemistry
- Others





> 60 EELA-2 applications



Applications

Click on the application name for details.

APP. NAME	DOMAIN	COUNTRY / INSTITUTION(S)	STATUS	VIDEO?	SERVICES
AERMOD	Earth Sciences	(CUBAENERGIA) (CITMATEL)	5	No	View map
AeroVANT	Engineering	(UNRC)	5	Yes	View map
AluJ	Computer Science and Mathematics	(UFRJ)	5	No	View map
ALICE	HEP	(CIEMAT) (UNAM)	5	No	Still due
ATLAS	HEP	(UNLP-IFLP)	5	No	Still due
BIG	Bioinformatics	(UFV)	5	Yes	View map
BiMD	Bioinformatics	(UFRJ)	5	Yes	View map
BiOME	Bioinformatics	(UCM)	5	No	View map
BiSyS	Systems biology	(UCI) (CIM)	2	No	-
BRAMS	Earth Sciences	(UFCG)	5	Yes	View map
C/CATT-BRAMS	Earth Sciences	(UCH-CMM) (INPE)	4	No	View map
CAM	Earth Sciences	(GENAMH) (UNICAN) (UCH-CMM)	5	Yes	Still due
CardioGrid Portal	Biomedicine	(UBA)	5	Yes	View map
CATVLC	Chemistry	(UCV)	3	Yes	-
Cinefilia	Computer Science and Mathematics	(INFN)	5	Yes	View map
CIS	Earth Sciences	(UTPL)	5	No	View map
CMS_SW	HEP	(UNIANDES)	5	No	Still due
CROSS-Fire	Civil Protection	(EP)	4	Yes	View map
DicomGrid	Biomedicine	(EP)	5	Yes	View map
Dist-SCM-PORTRAIT	Bioinformatics	(EP)	5	Yes	View map
DistBlasit	Bioinformatics	(UPB)	4	No	View map
DxEsG	Fusion	(CIEMAT)	5	No	View map
DRI/Alarmogrid	Biomedicine	(MAAT) (CETA-CIEMAT)	4	No	View map
eIMRT	Biomedicine	(CESGA)	4	Yes	Still due
EMRI	Biomedicine	(UA)	5	Yes	View map
G-HAMMER	Bioinformatics	(UNIANDES)	5	No	View map
G-InterProScan	Bioinformatics	(UNIANDES)	3	No	-
gCSMT	Earth Sciences	(IPGP)	5	No	View map
GenecodesGrid	Bioinformatics	(UCM)	5	No	View map
e-Learning	(MAAT)	2	No	-	
gEMBOSS	Bioinformatics	(UNAM)	4	No	View map
Grid Bio Portal	Bioinformatics	(UFV)	5	No	View map
GRIP	Biomedicine	(UFRO) (UTFSM)	5	Yes	View map
GROMACS	Chemistry	(UFRJ)	5	Yes	View map
gRREEM	Engineering	(CUBAENERGIA)	5	Yes	View map
gSATyrus	Computer Science and Mathematics	(UFRJ)	5	Yes	View map
Heart Simulator	Cardiology	(UFP)	5	Yes	View map
HiMiLab	Biomedicine	(LNCC)	5	Yes	View map
HPC Structure	Bioinformatics	(EP)	5	Yes	View map
Industry@Grid	Engineering	(EP)	5	Yes	View map
Integra-EPI	Epidemiology	(EP)	5	No	View map
InvCall	Cardiology	(EP)	5	No	View map
INVTissue	(EP)	2	No	-	
LEMDisJFF	(EP)	3	No	-	
LHP	(EP)	5	No	Still due	
(EP)	(EP)	2	No	-	
(EP)	(UNAM)	4	No	View map	
(EP)	(UFRJ)	2	No	-	
(EP)	(CIEMAT)	4	No	View map	
(EP)	(UFV)	3	No	View map	
(EP)	(CIEMAT) (IDEA)	4	No	Still due	
(EP)	(UNAM) (INFN) (UNLP-IFLP)	4	No	View map	
(EP)	(UF)	5	Yes	View map	
Portal de Porticos	Engineering	(ULA)	4	Yes	View map
ProzoaDB	Life Sciences	(FIOCRUZ) (UFRJ)	5	No	Still due
PSA/IFMP	Engineering	(UAEM) (TVer)	5	Yes	View map
SATCA	Earth Sciences	(UPB)	4	Yes	View map
Seismic Sensor	Earth Sciences	(UNAM)	5	No	View map
SEMUM3D	Earth Sciences	(IPGP)	4	No	View map
WAM	Earth Sciences	(CMRC)	4	Yes	View map
WIRE	Earth Sciences	(UNICAN)	5	No	View map

Total of Applications: 61



Applications > Statistics

Home

Applications

Status Classification

Statistics

Monitoring

HEP Applications

Web portals

Propose an Application

Gridification FAQ

Self Training

Technical Support

Training Events

Call for Papers

Publications

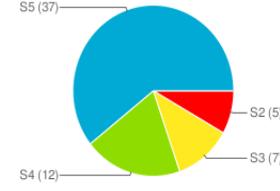
Acknowledgement

About NA3

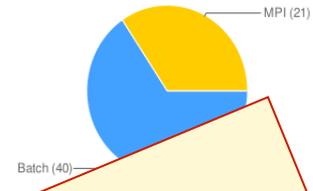
Staff

Mailing Lists

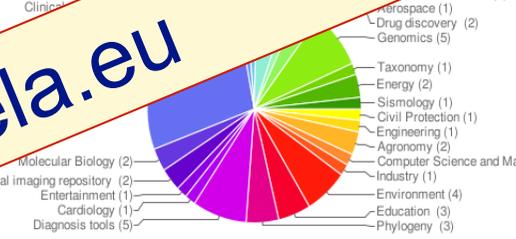
Distribution by readiness status



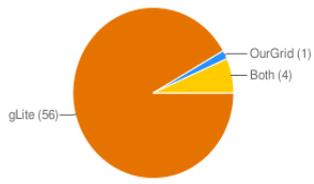
Applications' profile



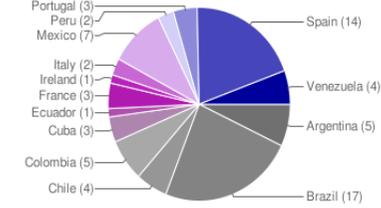
Distribution by domain



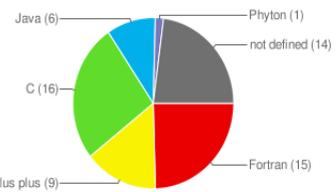
Distribution by middleware



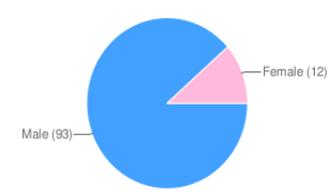
Distribution by country



Distribution by programming languages

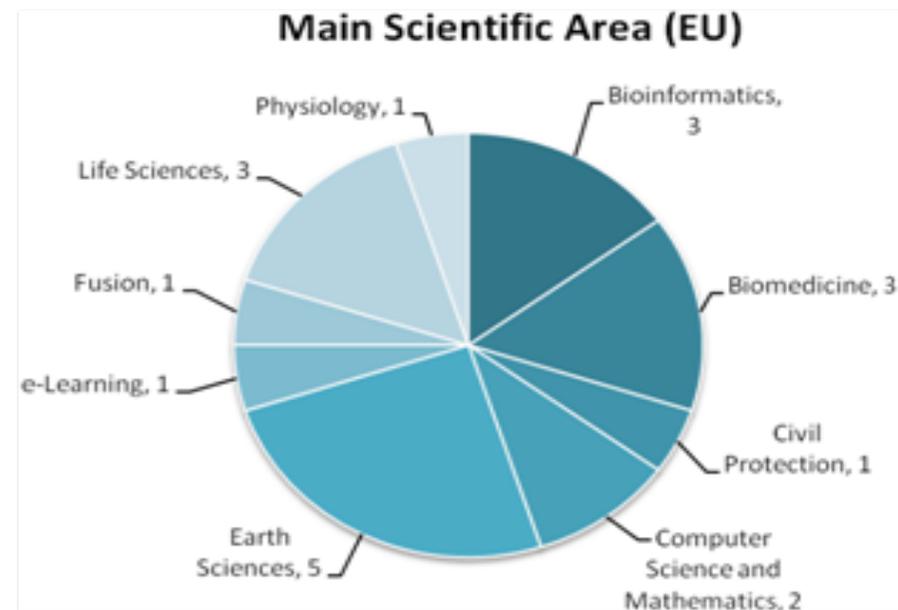
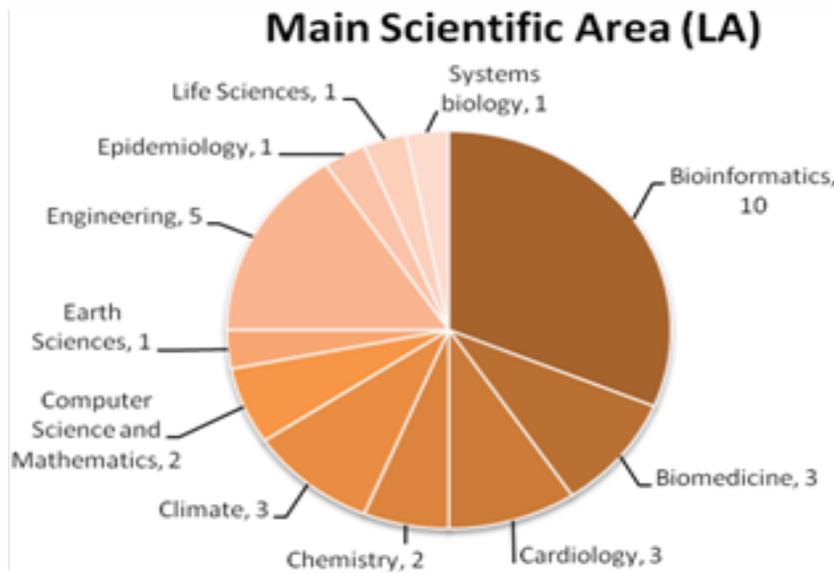


Genre distribution - prod.vo.eu-eela.eu users



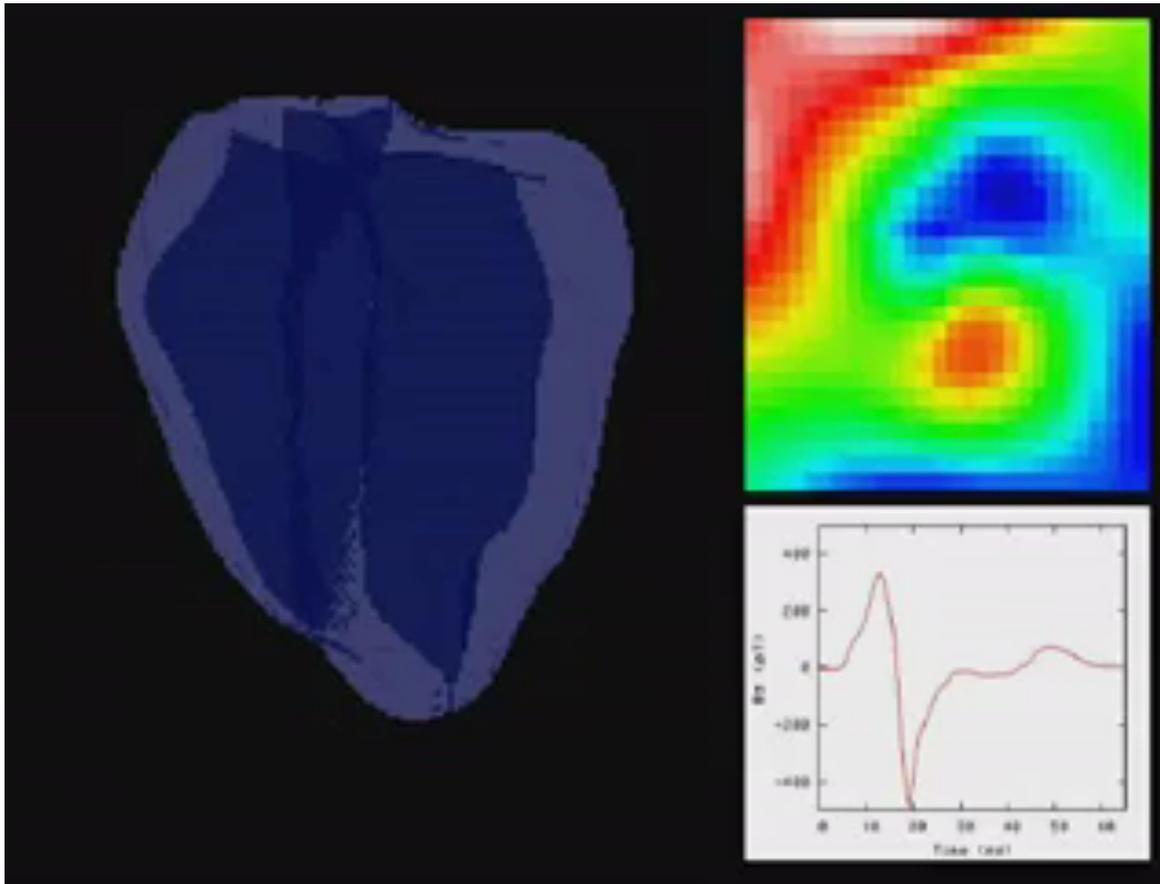
<http://applications.eu-eela.eu>

- >15% increase w.r.t. the DoW



Feasibility of application deployment rather than production of results!

- Life Sciences / Biomedicine



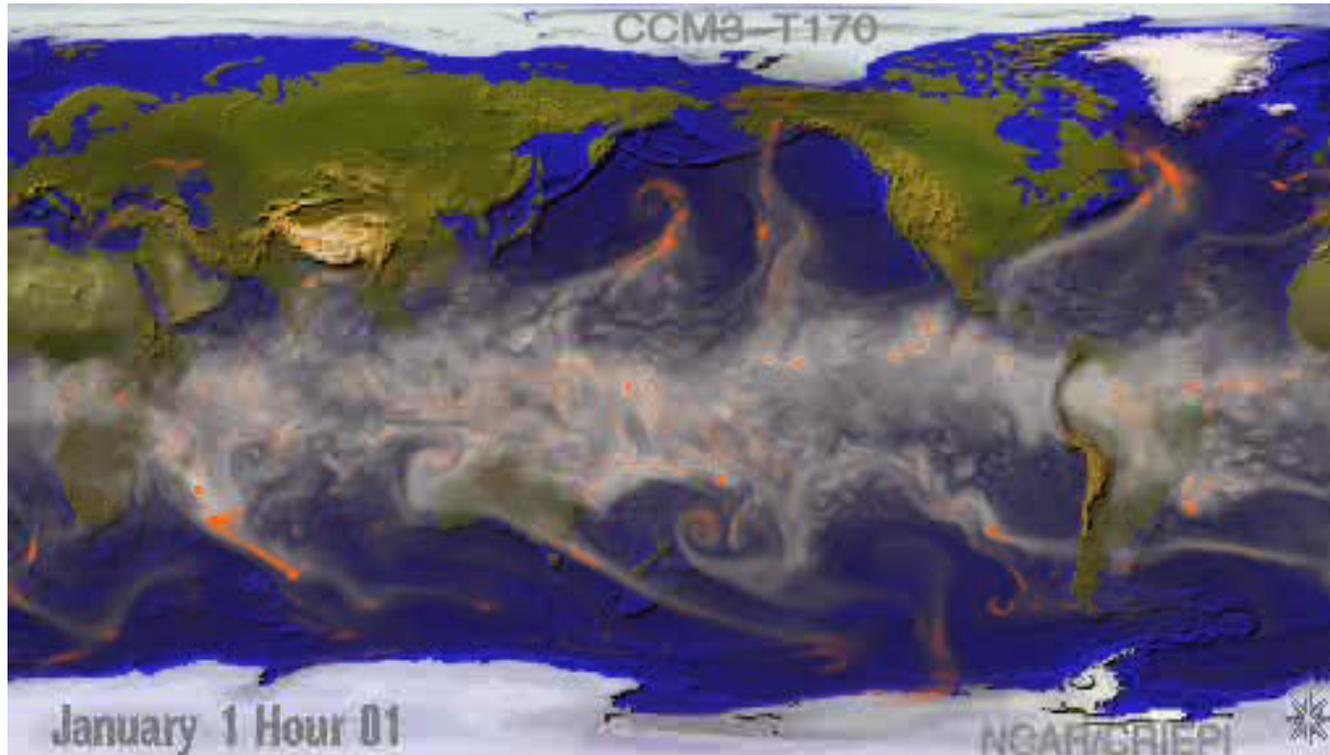
Heart Simulator UFJF - Brazil

The current computational models track the electro-mechanics of the heart from sub-cellular to the whole-organ level and, therefore, allow a better comprehension of important cardiac diseases, such as Ventricular Arrhythmia, Myocarditis, Infarct, Chagas Disease, Diabetes, etc. In addition, the cardiac response to drugs can be better quantified.

A single heart beat can be computed in 10 hours, when running in a 64-node cluster. However, model parameter studies as well as associated inverse problems will demand thousands of single-beat simulations.

http://applications.eu-eela.eu/application_details.php?l=20&ID=12

- Earth Science

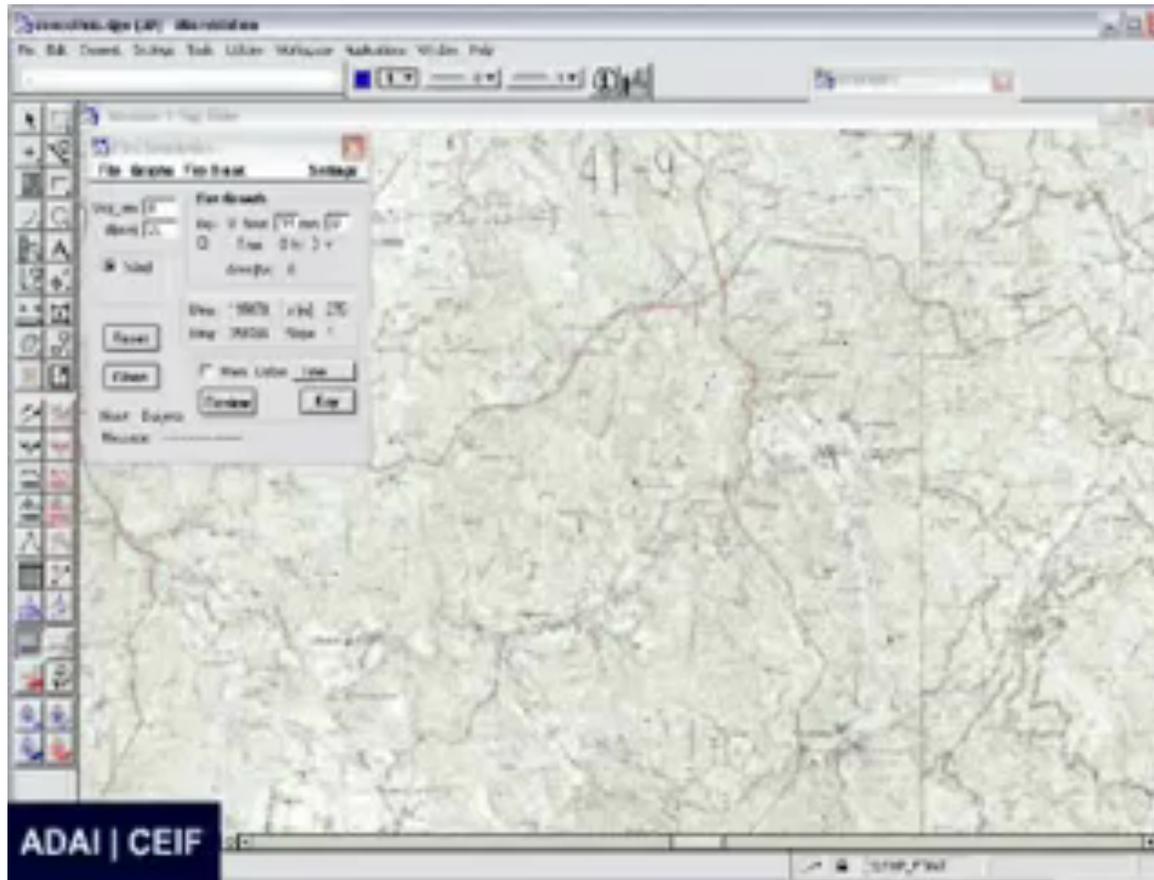


Weather predictions UNICAN - Spain

The Weather Research and Forecasting Model (www.wrf-model.org) is a next-generation mesoscale numerical weather prediction system designed to serve both operational forecasting and atmospheric research needs. It features multiple dynamical cores, a 3-dimensional variational (3DVAR) data assimilation system, and a software architecture allowing for computational parallelism and system extensibility. WRF is suitable for a broad spectrum of applications across scales ranging from meters to thousands of kilometers.

http://applications.eu-eela.eu/application_details.php?l=20&ID=65

- **Civil Protection**



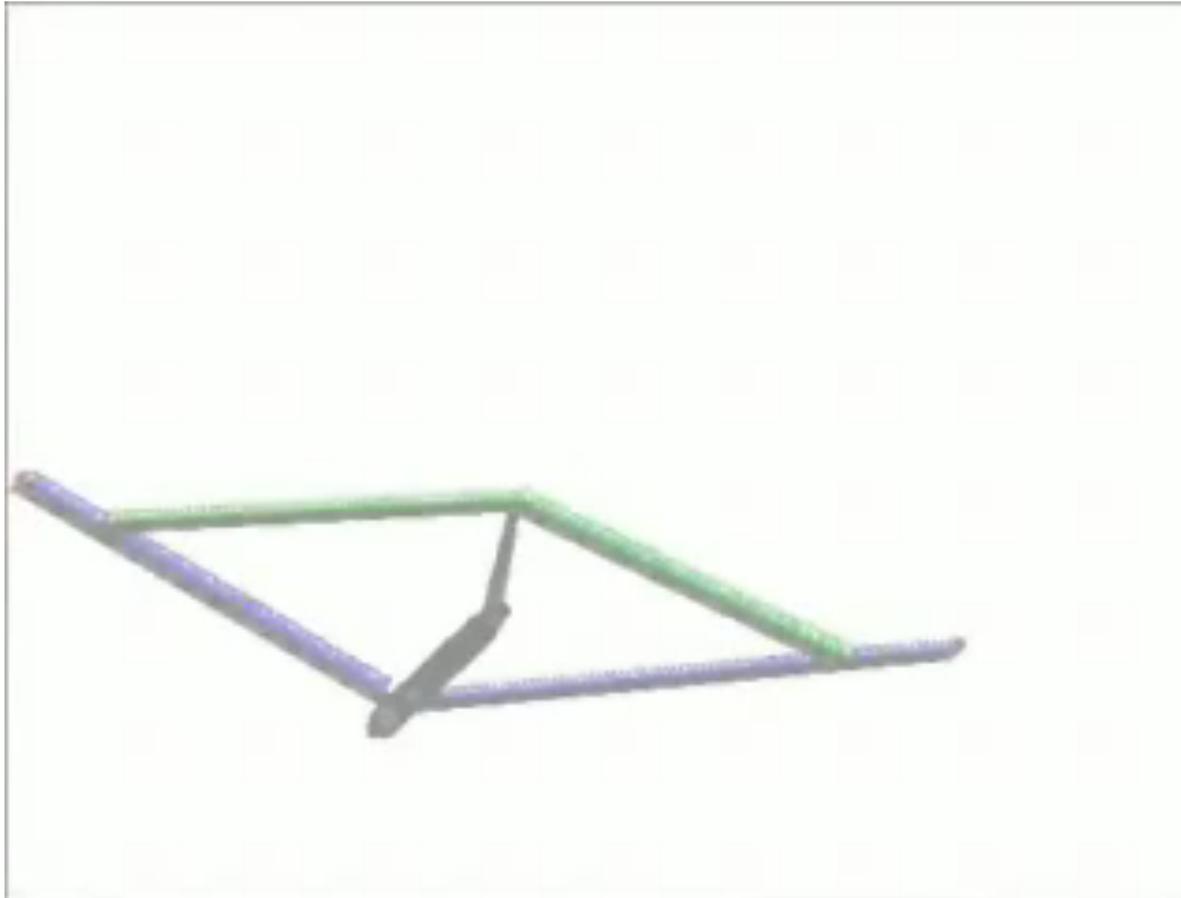
CROSS-Fire U.Minho - Portugal

Collaborative Resources
Online to Support
Simulations on Forest Fires

Forest fires represent a typical CP emergency case that requires a fast and reliable risk management support system, with real-time or near real-time availability of critical geo-referenced data and settings-based forecasts for fire spreading.

http://applications.eu-eela.eu/application_details.php?l=20&ID=8

- **Aerospace Manufacturing**



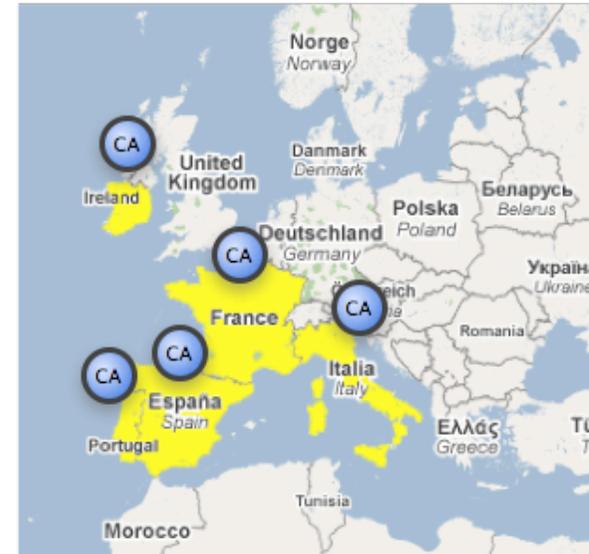
**AeroVant
UNRC - Argentina**

This application simulates nonlinear and unsteady behavior of joined wings, high altitude, long endurance unmanned aerial vehicles.

http://applications.eu-eela.eu/application_details.php?l=20&ID=67

SA1 = Grid Infrastructure Service Activity

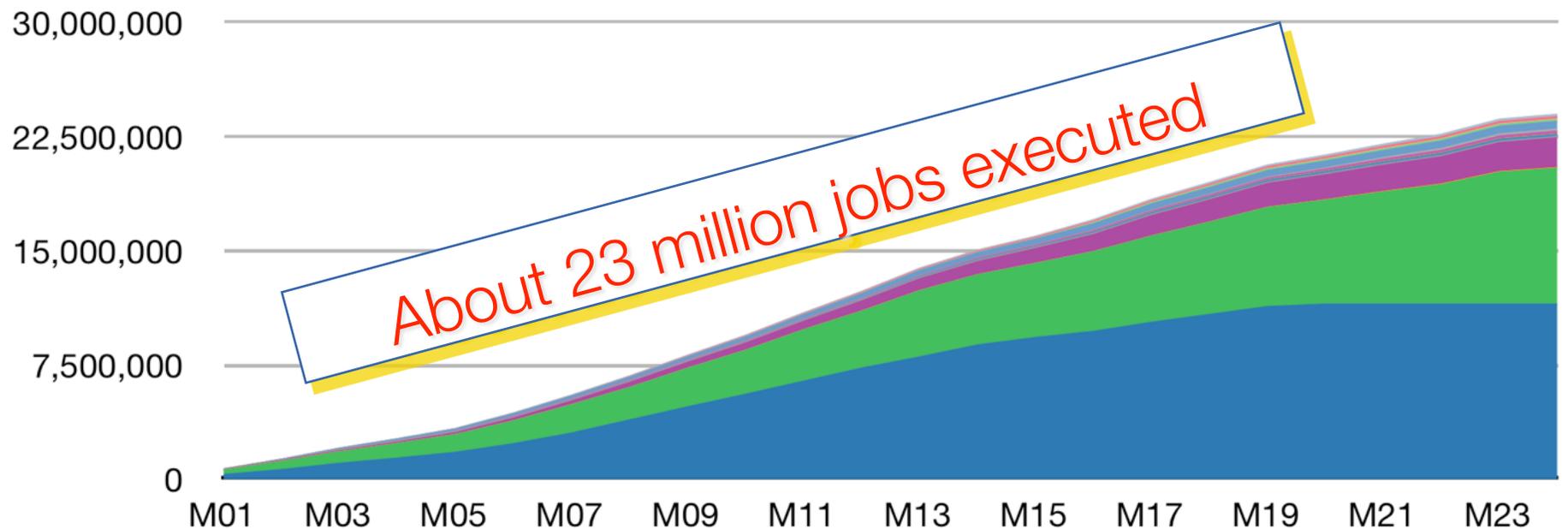
Every EELA-2 country has access to the LA PKI



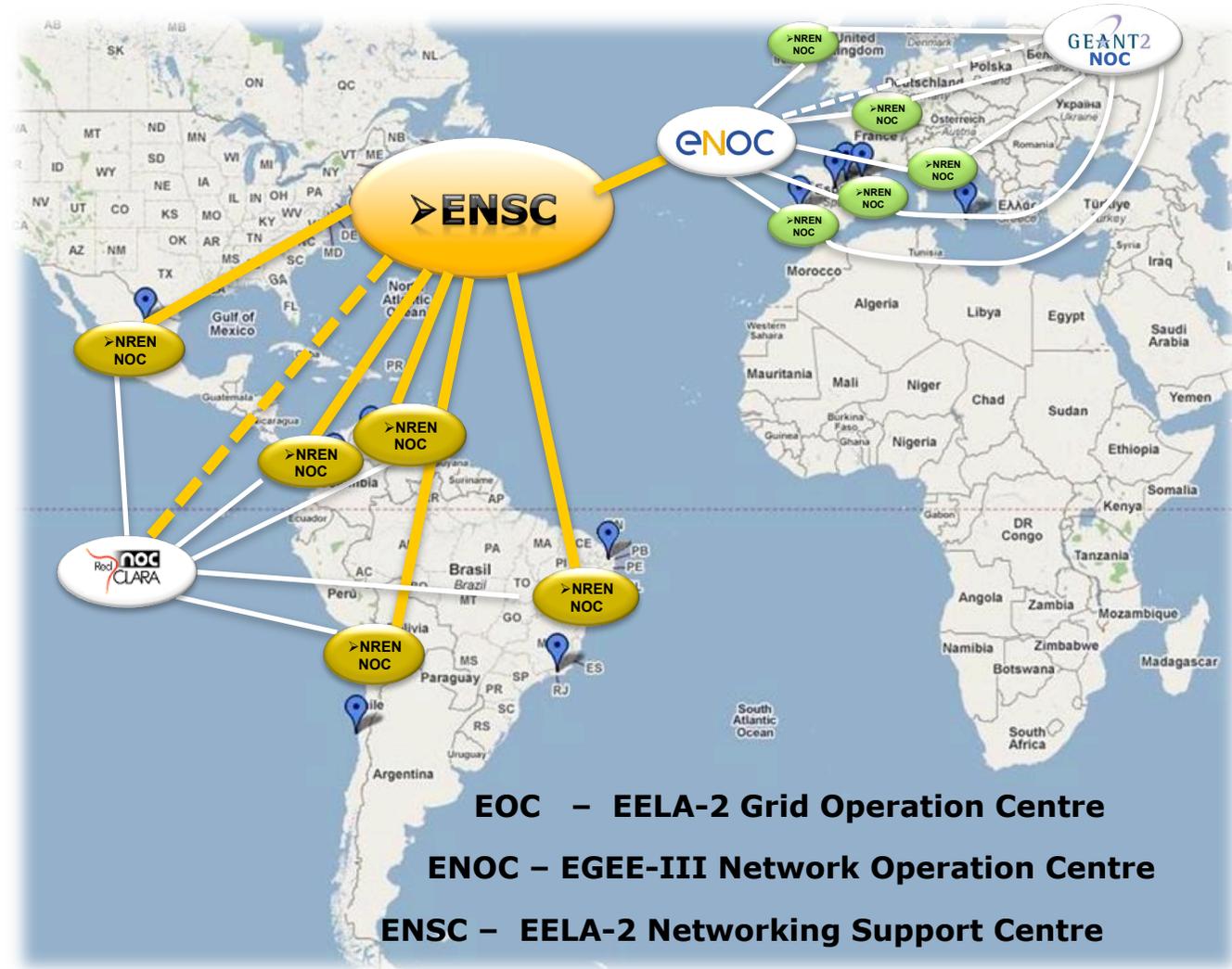
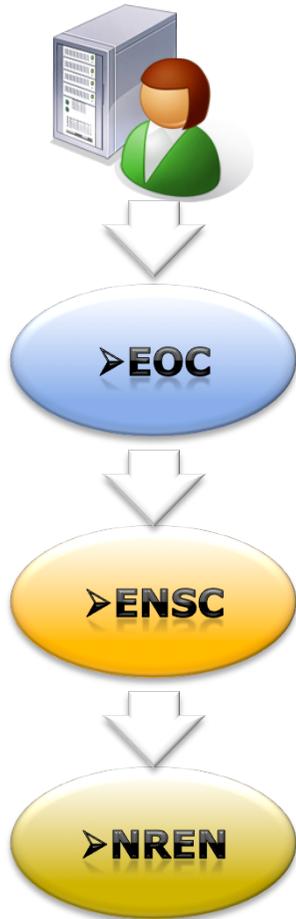
- CA Certification Authority
- RA Registration Authority
- A CA Applicant
- CAII Catch All Certification Authority

Infrastructure Usage - all VOs

Cumulative executed jobs



- | | | | |
|--------------|------------------|-------------|------------|
| CERN_PROD | IN2P3-CC | CEFET-RJ | CESGA-EELA |
| csTCDie | EELA-CETA-CIEMAT | EELA-CIEMAT | EELA-UFCG |
| EELA-UNLP | EELA-UTFSM | ICN-UNAM | IEETA |
| INFN-CATANIA | UFRJ-IF | ULA-MERIDA | Uniandes |
| UNICAN | UPorto | UPV-GRyCAP | |



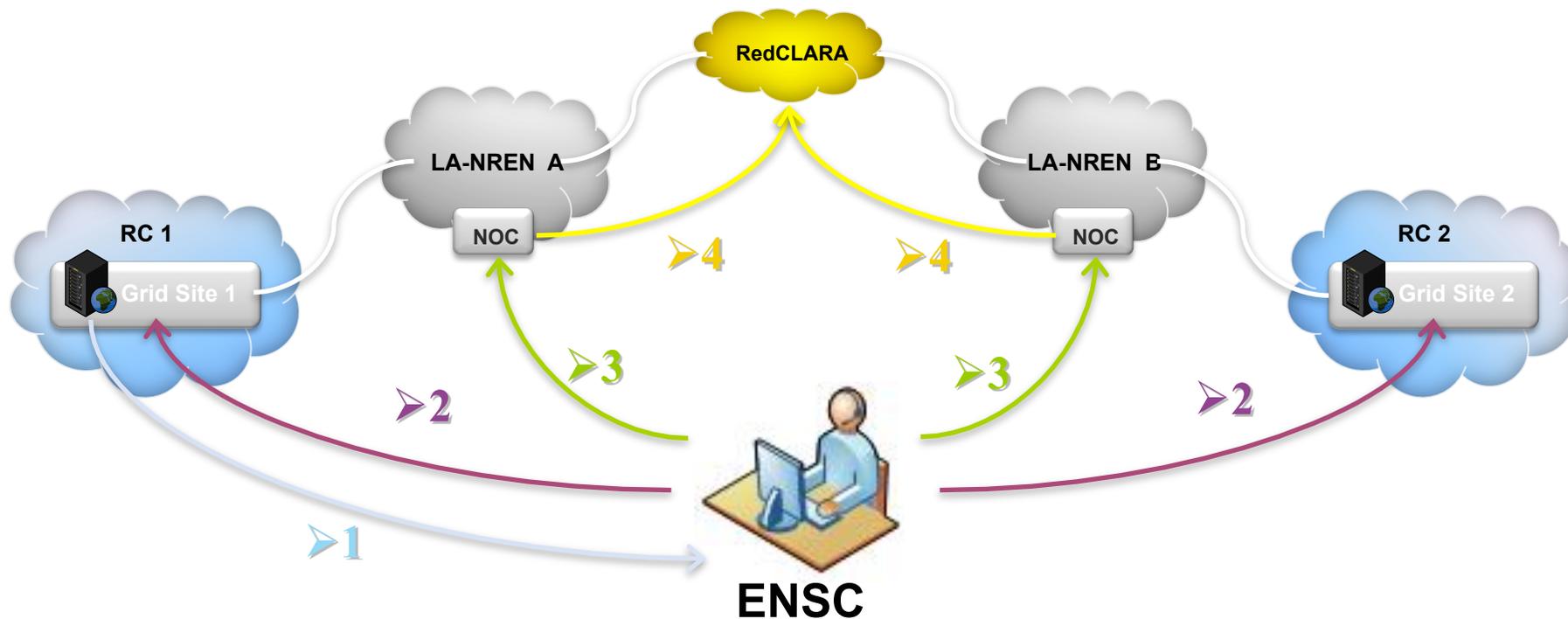
EOC – EELA-2 Grid Operation Centre

ENOC – EGEE-III Network Operation Centre

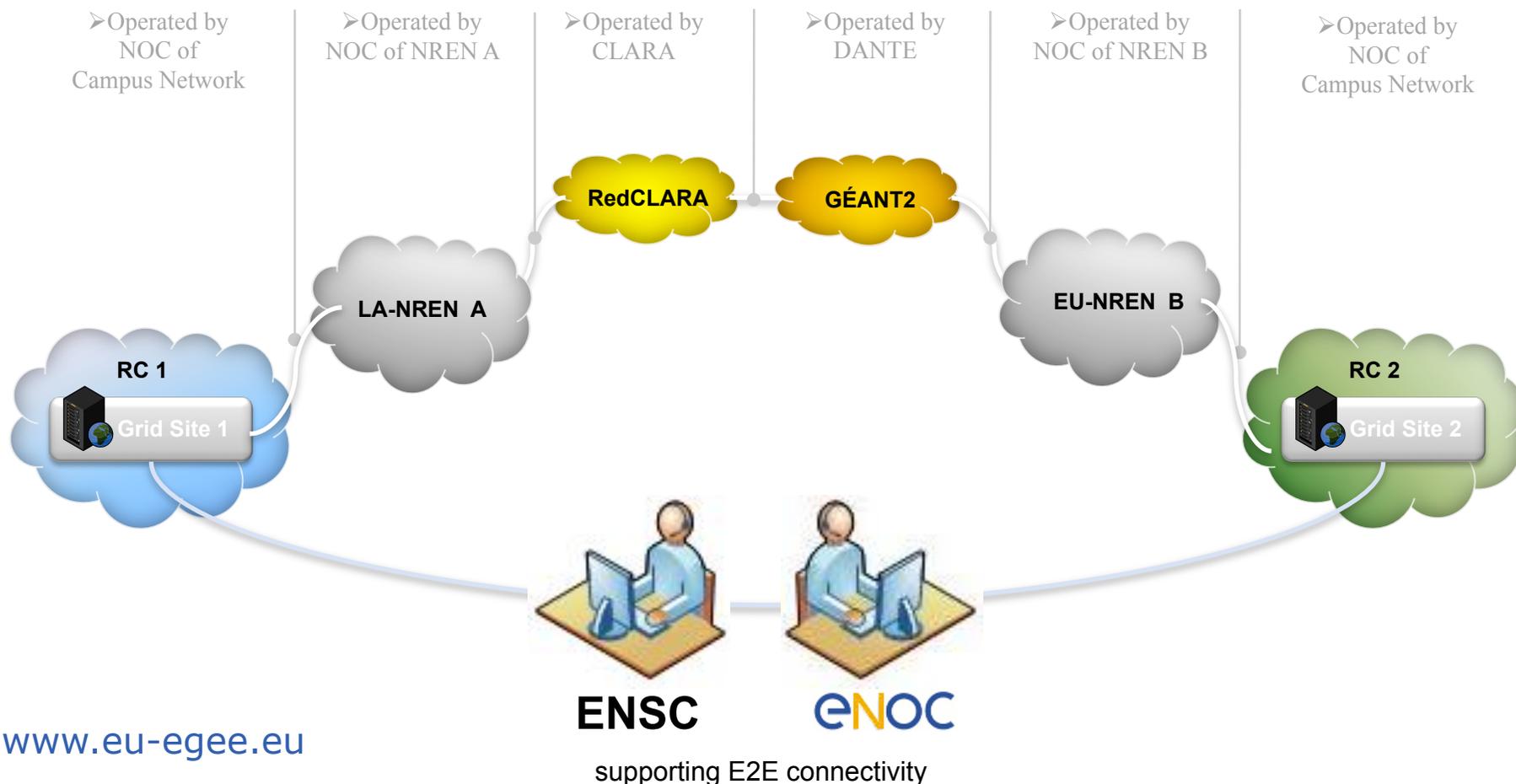
ENSC – EELA-2 Networking Support Centre

Interaction between ENSC and the NREN NOCs

- 1 Site contacts ENSC
- 2 Use of monitoring tools to verify network connectivity
- 3 ENSC contacts NREN NOCs
- 4 NREN NOCs contact CLARA NOC



- In the context of Latin America and Europe
Collaboration with EGEE network support*



* www.eu-egee.eu



EELA-2 Achievements – JRA1

- All Infrastructure and Applications-oriented services have operational versions available in the Forge software repository
 - <https://forge.eu-eela.eu>
- All proposed services have been **successfully used by at least one application or by the SA1 team**
- Stable gLite (Service)  OurGrid (Opportunistic) Gateway **available in the production infrastructure**
- Production opportunistic infrastructure powered by OurGrid
- Port of the **gLite** User Interface, Computing Element and Worker Nodes components to the **Microsoft Windows platform**
- OurGrid support for Bag-of-task applications
- 11 out of 52 applications (in S4 or S5 state) benefited
- **21 scientific papers**, including: 2 in international journals, 3 book chapters, 8 in proceedings of international conferences, 9 in proceedings of the EELA-2 conferences



From

EELA-2

E-science grid facility for Europe and Latin America

To

GISELA

Grid Initiatives for e-Science virtual communities in Europe and Latin America

Submitted to the FP7 INFRA-2010-2 call

Topic INFRA-2010-1.2.3: Virtual Research Communities

Hearing meeting on 10/02/2010

Impressive mark! 14.5 / 15



GISELA objectives and goals

Plan for the long- term sustainability of the e-Infrastructure in the Latin American continent

Full support of the Virtual Research Communities spanning Latin America and Europe, using the e-Infrastructure.

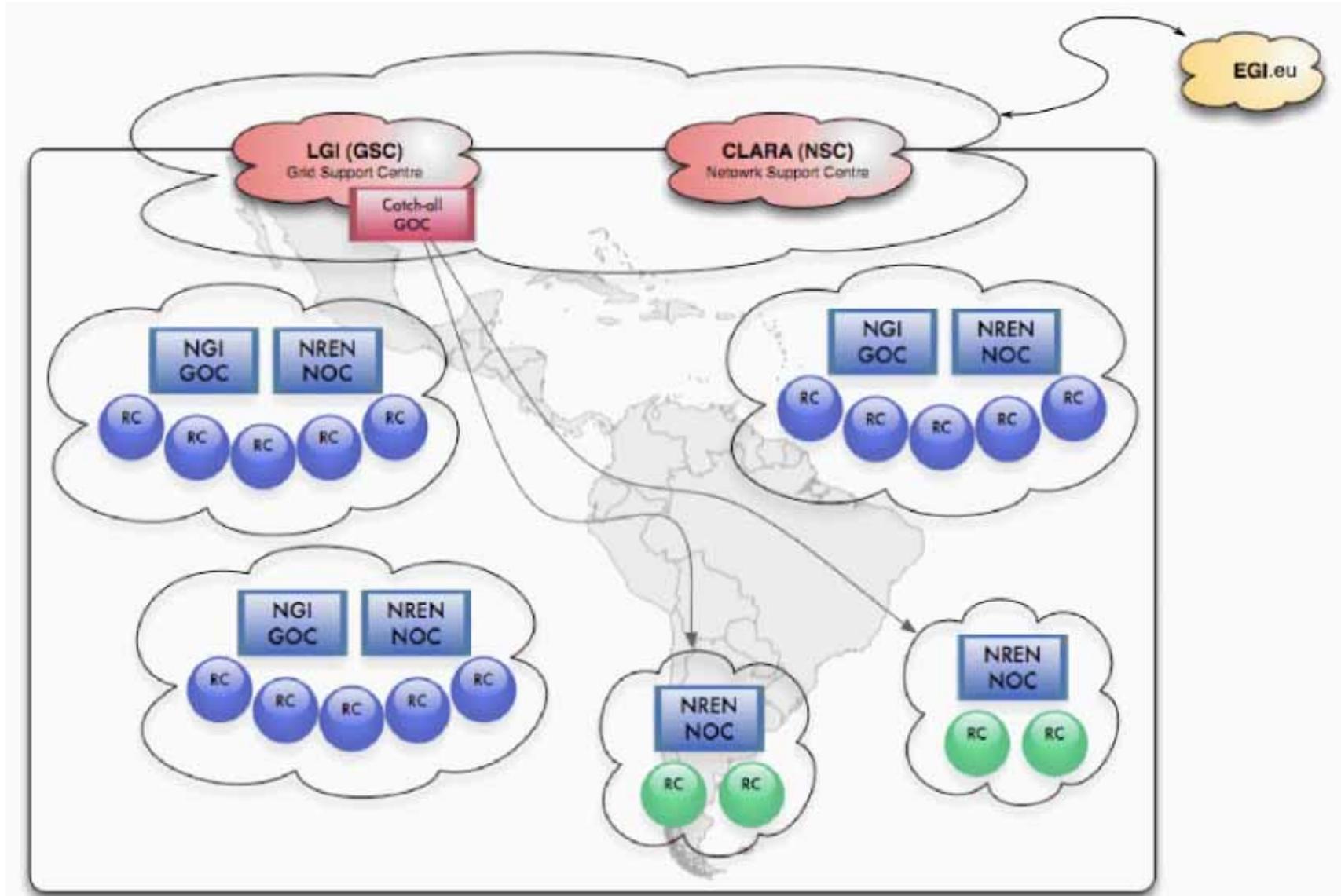
Focus on two inter-related goals:

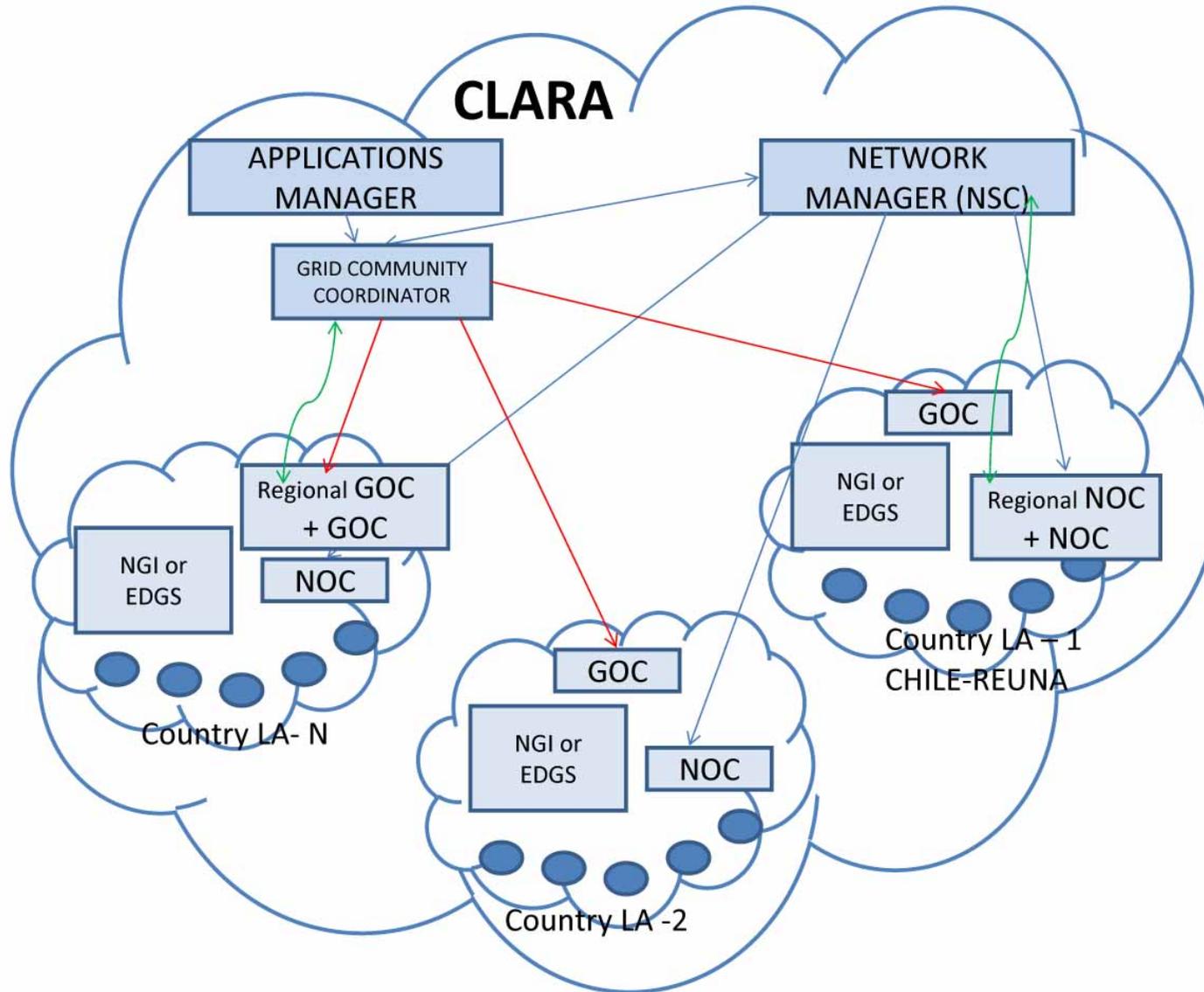
- Implement the NGI / LGI sustainability model, as specified in DSA1.3 (<http://documents.eu-eela.org/record/1119/files/>), **in association with CLARA and collaborating with EGI.**
- Provide the communities with the suited e-Infrastructure and Application-related Services required to improve the effectiveness of their research. This will address both:
 - ✓ **The current EELA-2 User Communities** whose research investigations are carried out at the Institution level or in small collaborations.
 - ✓ **The larger Virtual Research Communities** whose Grid future support is anticipated to be implemented through the new instrument called “Specialised Support Centre” (SSC).

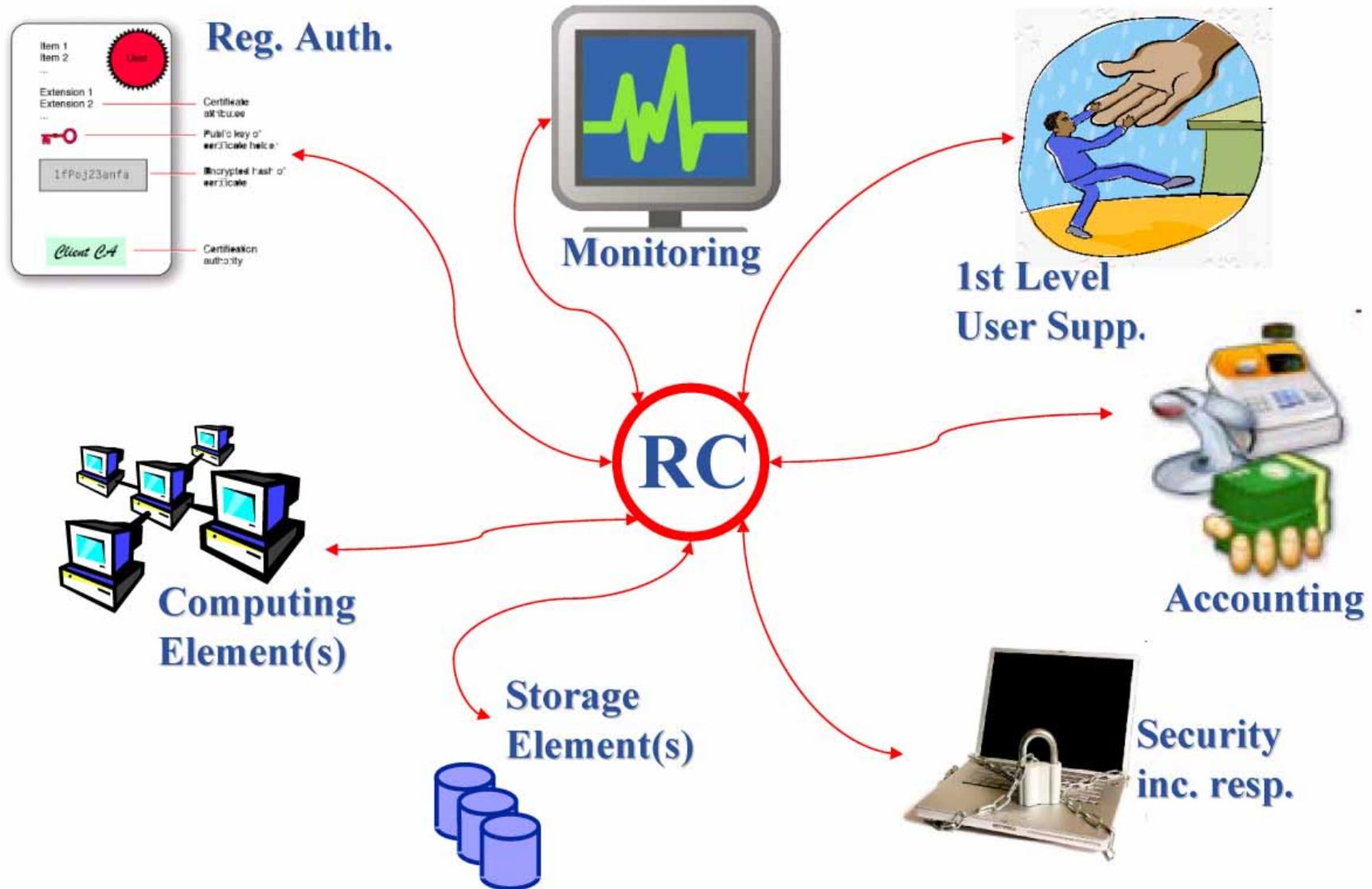


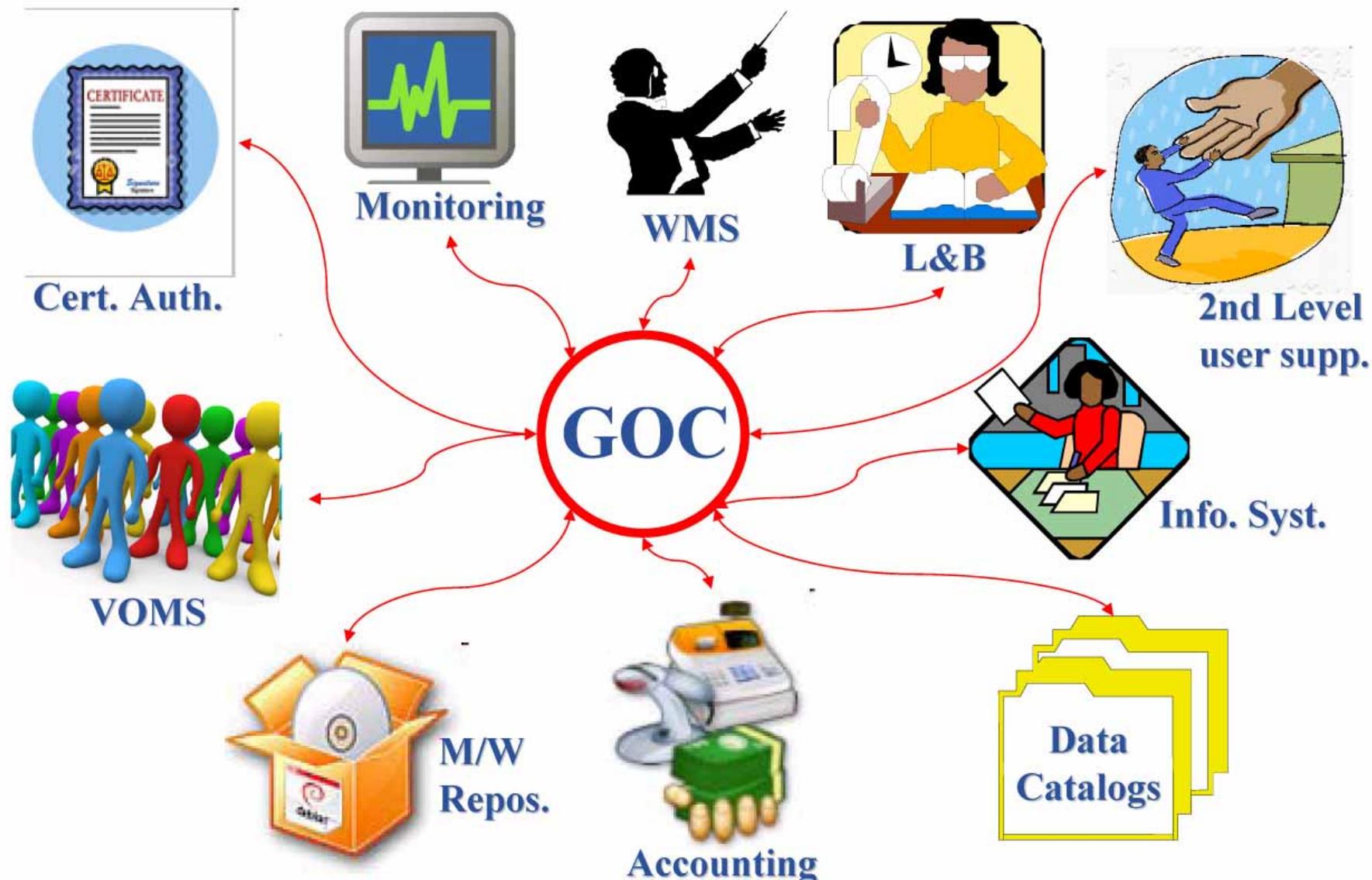
EELA-2 Sustainability Model

(<http://documents.eu-eela.org/record/1119/files/>)

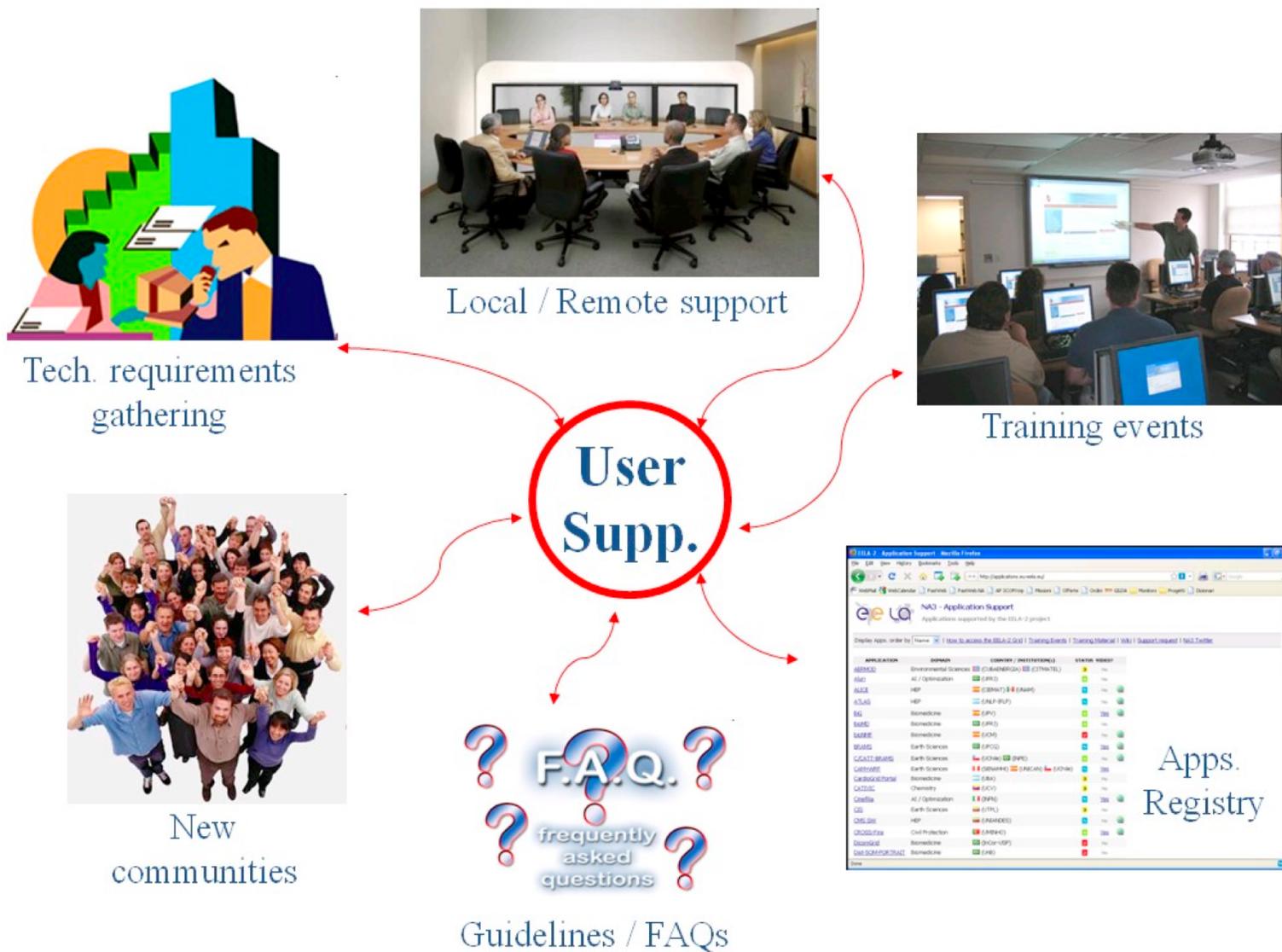












Application Support - eela.eu

NA3 - Application Support

Applications supported by the NA3-2 project

APPLICATION	DOMAIN	COUNTRY / INTERESTING	STATUS	VERSION
AMSD	Environmental Sciences	ES (BARCELONA) ES (ETHANTEL)	Yes	
ALICE	AI / Optimization	ES (SFC)	Yes	
ALICE	HEP	ES (SFC) ES (ZARA)	Yes	
ALICE	HEP	ES (SFC) ES (SFC)	Yes	
ALICE	Bioinformatics	ES (SFC)	Yes	
ALICE	Bioinformatics	ES (SFC)	Yes	
ALICE	Bioinformatics	ES (SFC)	Yes	
ALICE	Earth Sciences	ES (SFC)	Yes	
ALICE	Earth Sciences	ES (SFC) ES (SFC)	Yes	
ALICE	Earth Sciences	ES (SFC) ES (SFC)	Yes	
ALICE	Earth Sciences	ES (SFC)	Yes	
ALICE	Chemistry	ES (SFC)	Yes	
ALICE	AI / Optimization	ES (SFC)	Yes	
ALICE	Earth Sciences	ES (SFC)	Yes	
ALICE	HEP	ES (SFC)	Yes	
ALICE	Civil Protection	ES (SFC)	Yes	
ALICE	Bioinformatics	ES (SFC)	Yes	
ALICE	Bioinformatics	ES (SFC)	Yes	



Iniciativa de **Grid de America Latina - Caribe**

- EGI / EGEE ROC
- LA Resource Centres deployment and maintenance assistance
- **Multi-middleware support**
- Prod VO maintenance/operations
- Interface between service grids in LA (eg. GISELA) and Europe (eg. EGI)
- VRC support
- Officially launched on December 2009 with guaranteed funding up to December 2010
- Currently pledged resources
 - ~800 job slots and ~30 TB of storage
 - multi-middleware (gLite, OurGrid, OSG)
- Fully open to new services / partnerships

All interested institutions invited to actively participate

roc@igalc.org



- EELA was a success, recognised by the **highest EC ranking**
- **EELA and EELA-2, with the constant support of CIEMAT**, drastically changed the perspectives about e-Science in Latin America
- **Long-term sustainability of e-Infrastructures worldwide is key for a continued support of Scientific Communities**
- **CLARA**, an EELA / EELA-2 Partner, is becoming a **major GISELA actor**
 - GISELA proposal submitted on 23/11/09
 - Negotiation concluded on 26th April 2010
 - Hopefully starting on 1st September 2010 !...
- **IGALC is filling the gap between EELA-2 and GISELA**
- **Future collaboration with**
 - VRCs and SSCs: mandatory!!!!
 - Sister projects (EGI, EUAsiaGRID, etc.) natural and ... certainly useful
- **CIEMAT still fully supporting GISELA (€ and)**

- **GISELA and the LGI are eager to collaborate with...**
 - PT-Grid? ES-Grid? IBERGrid? WhateverGrid?...

- **How?**
 - Hopefully working together (MoUs are fine but insufficient)
 - Training
 - Infrastructure and application-oriented services
 - Identification of common scientific interests (Climate, Healthcare, Earth Sciences, ...)

- **When?**
 - If possible ... yesterday

And now ... hands on





- **Project website**
 - www.eu-eela.eu
- **Final review of EELA**
 - <http://indico.eu-eela.eu/conferenceOtherViews.py?view=standard&confId=113>
- **First review of EELA-2**
 - <http://indico.eu-eela.eu/conferenceOtherViews.py?view=standard&confId=193>
- **Final review of EELA-2**
 - <http://indico.eu-eela.eu/conferenceOtherViews.py?view=standard&confId=229>
- **LGI model**
 - <http://documents.eu-eela.org/record/1119/files>



When a leading institution consider that
it is the NGI
instead of being just a **member** of a community...