

Las e-infraestructuras en el 7PM y la convocatoria FP7- INFRASTRUCTURES

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European Commission, DG INFSO

GÉANT & e-Infrastructures



e-infrastructure

Jornada informativa: Las Infraestructuras Científicas en el Séptimo
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European Commission
Information Society and Media



Vision de e-Infrastructures

capacitar a las comunidades de investigación a través de un acceso fácil, seguro y ubicuo a los servicios de datos, computación, comunicación y trabajo colaborativo



Mantenerse competitivo en Ciencia

- Colaboraciones a escala global
 - Comunidades virtuales de investigación globales
 - Cooperación internacional (interconectividad)
- Ciencia e Innovación basada en datos
 - Uso y gestión de conjuntos de datos que crecen exponencialmente
- Experimentación *in silico*, simulación
 - **Uso de Computación de alto rendimiento (HPC)**

⇒ TIC elemento fundamental para I+D

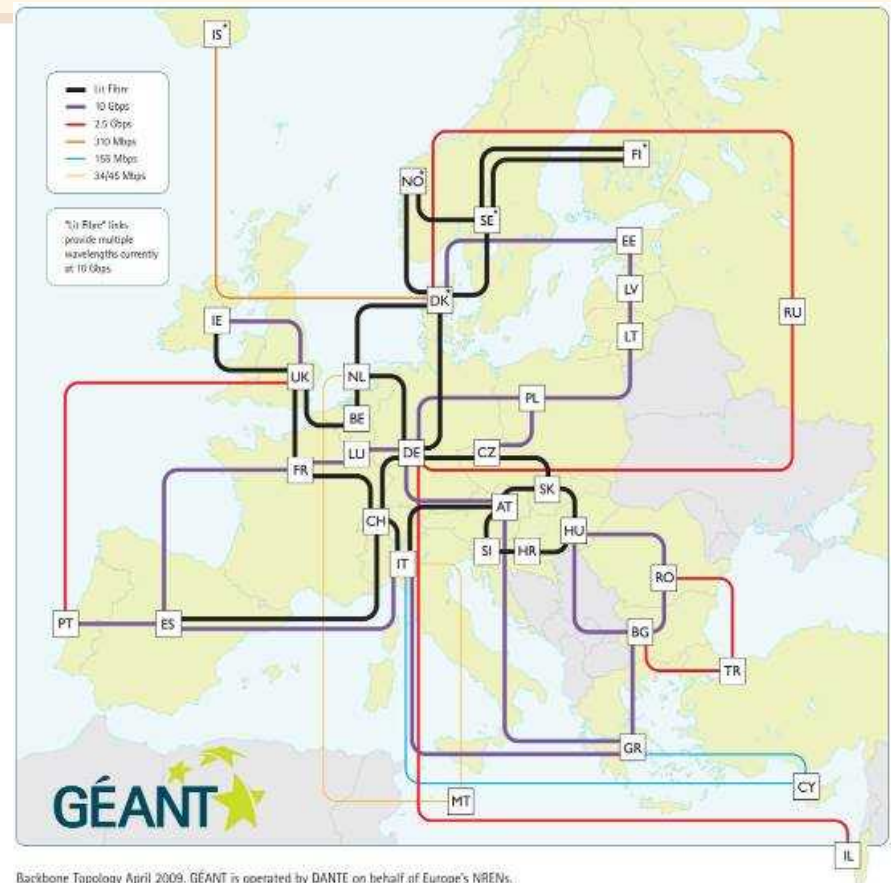


INFSO F3: e-infraestructuras, áreas de actividad



GÉANT: Conectando Europa

- Cobertura Pan-Europea
- 40+ países;
3500 instituciones;
~ 40 million
usuarios
- Enlaces co-financiados
 - USA, Rusia, Japón,
India, China,
Sudáfrica



Backbone Topology April 2009. GÉANT is operated by DANTE on behalf of Europe's NRENs.



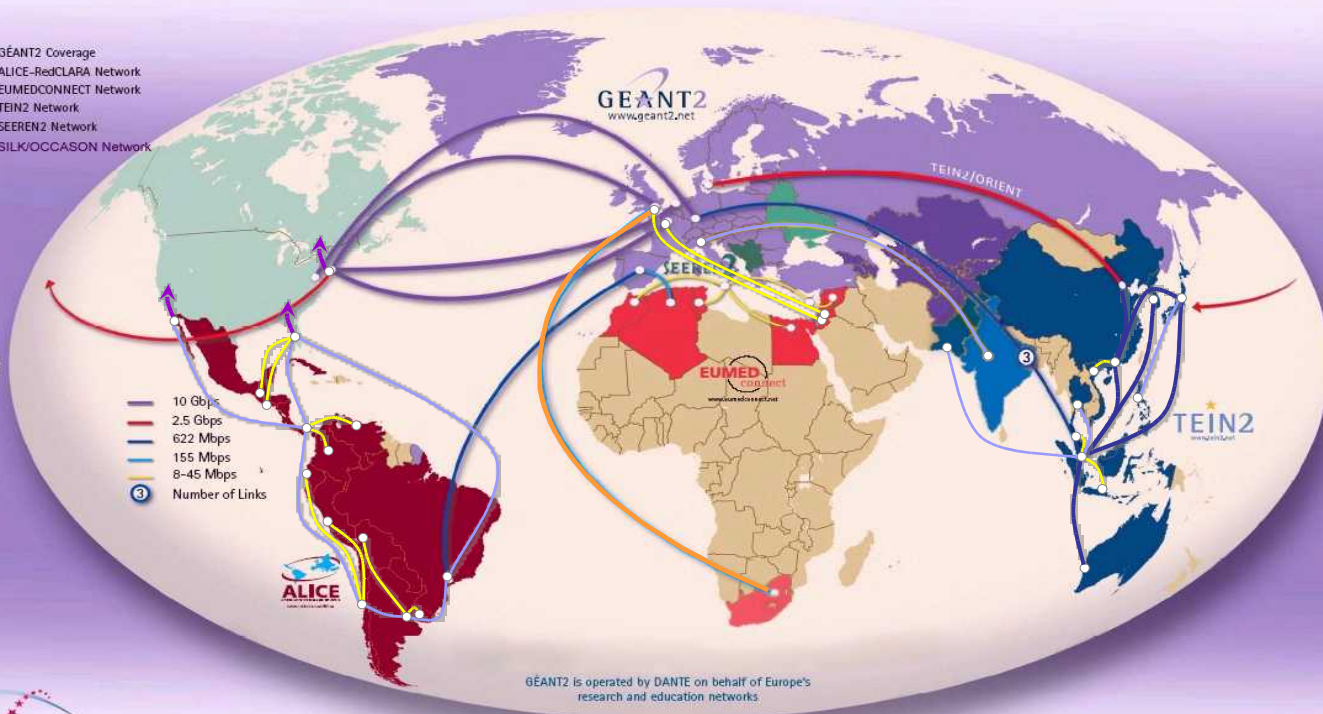
GÉANT: Alcance Global

GEANT2 At the Heart of Global Research Networking

- GEANT2 Coverage
- ALICE-RedCLARA Network
- EUMEDCONNECT Network
- TEIN2 Network
- SEEREN2 Network
- SILK/OCCASON Network

www.geant2.net

- 10 Gbps
- 2.5 Gbps
- 622 Mbps
- 155 Mbps
- 8-45 Mbps
- Number of Links



GEANT2 is operated by DANTE on behalf of Europe's research and education networks.

★ Connect ★ Communicate ★ Collaborate



Grids

eGEE
Enabling Grids
for E-science

Scheduled = 17356
Running = 18359

Astrophysics and astroparticle physics
Biomedical and bioinformatics
Computational chemistry
Computational sciences
High Energy Physics
Disaster recovery
Digital Libraries
Earth sciences
Infrastructure
Geophysics
Finance
Fusion

- >340 sites
- >70 000 CPUs, 25 PByte of storage
- ~150 000 jobs successfully completed per day
- 270 Virtual Organisations
- >8000 registered users, representing 1000s of scientists

08.54.09 UTC

GridPP
UK Computing for Particle Physics



JUGENE@Jülich

#4 worldwide, #1 in Europe



**1st PRACE
system**

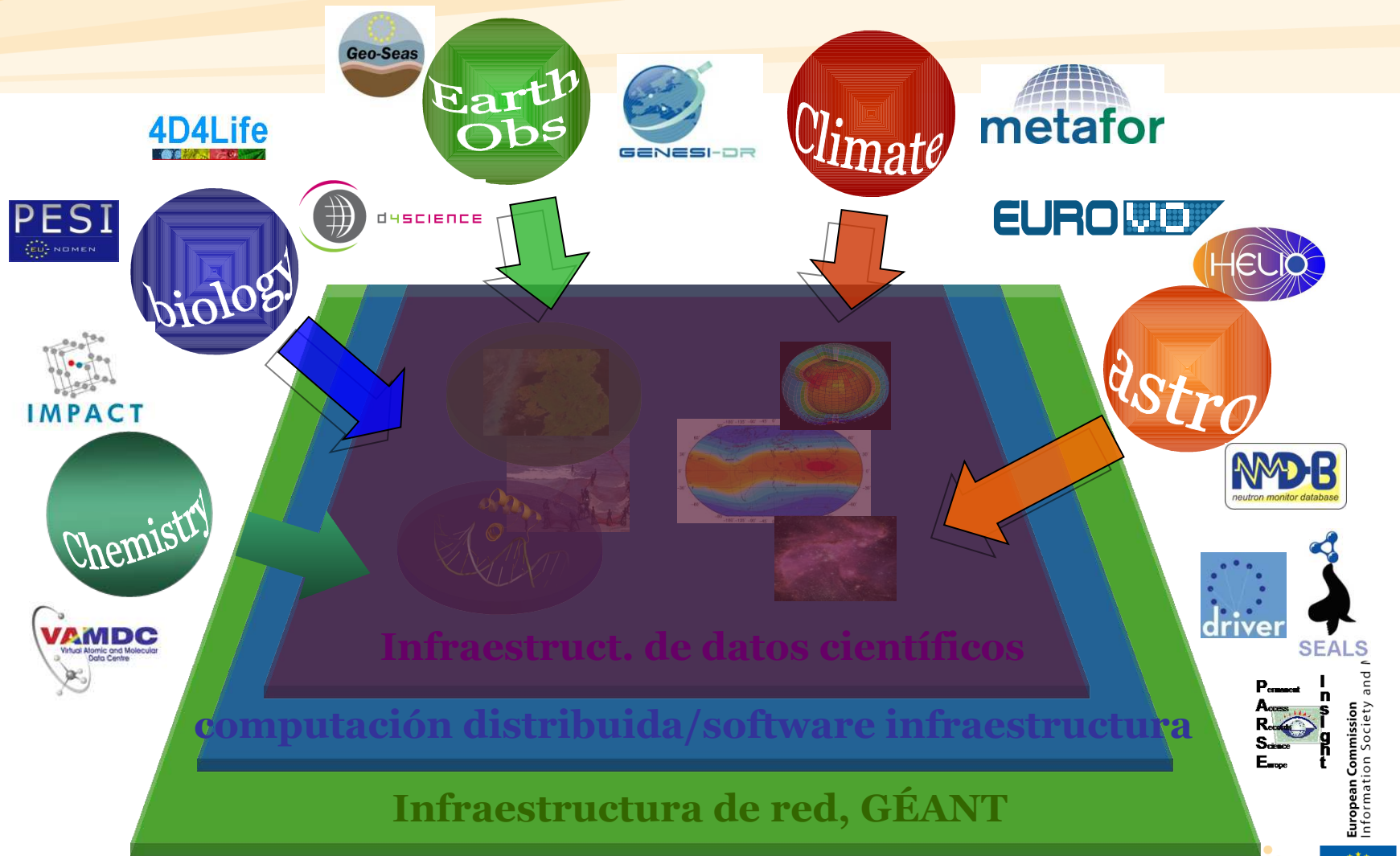
IBM Blue Gene/P
72 racks, 294912 cores
1 Petaflop/s peak

**2nd PRACE
System**

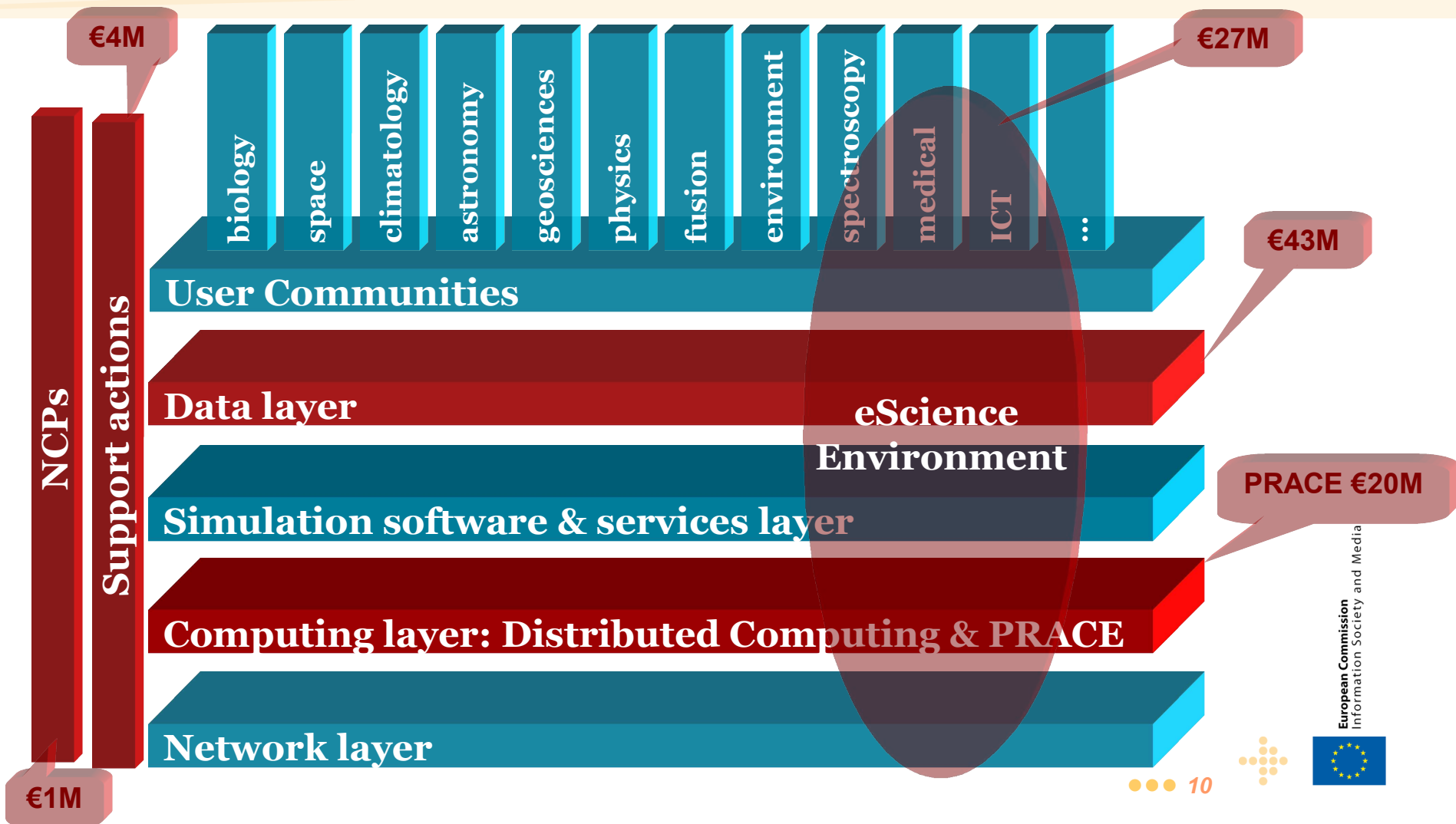
to come end 2010

**Exa-Scale
computing**

e-infraestructura de Datos Científicos



Planned Call 9 (closing 23.11.10, €95m)



INFRA-2011-1.2.1 : e-Science environments

Indicative budget

EUR 27 million

Funding Scheme

Combination of Collaborative projects and
Coordination and Support Actions (CP-CSA)

*(addressing Networking activities, Service activities, and Joint
Research activities)*

Contact

Enric Mitjana, Ioannis Sagias

Objectives

- General objectives:
 - Development and deployment of e-Science environments for use by virtual research communities
 - ... fostering a service-oriented culture and approach toward the user
- More specifically...



Specific Objectives

- Integrated service provision through seamless integration of the underlying networking, computing (grid and/or cloud and/or HPC) and data infrastructures
- Design, development and deployment of user-friendly interfaces which abstract service provision from the underlying infrastructure complexities
- Environments for virtual access to (remote) instruments as well as user-driven "composition" of virtual facilities and test-beds.
- Deployment of e-Science support centres and training activities (including for ESFRI communities)



Specific Considerations

All proposals should address **at least two of the above four sub-topics** and include **pilot implementations** to test the e-Science service environments and interfaces with particular user populations.

All proposals are strongly encouraged to consider:

- (a) the potential use of the developed e-Science environments by a broader user population than the scientists users themselves;
- (b) the international dimension of their activities;
- (c) the development and use of open standards and APIs to ensure openness of the e-Science environments to future applications and services;
- (d) appropriate licensing schemes for open source software.



Expected Impact

- Provision of advanced e-Science services better tailored to the user needs, supporting innovation and efficiency in the scientific discovery process
- Lower barriers to entry in e-Science environments by researchers
- Increased potential for e-Infrastructure usage by non-specialists, including "citizen scientists" and for public services

Examples of Activities

- Framework for describing scientific processes using a user-friendly graphic interface that automatically and dynamically over time reserves the necessary transmission bandwidth, computing resources (grid and/or cloud and/or HPC) and storage space
- Public cloud platform providing integrated e-Science services targeting research teams that do not have access to appropriate computing equipment
- Web 2.0 toolbox to extend access to e-Infrastructures beyond the tech-savvy users



Examples of Activities

- Application allowing non-professional researchers (citizens, school kids) to access a scientific facility from the PC at home, improving their understanding of the science done and possibly contributing to the research
- Provision of support for porting scientific applications to the most appropriate environment (e.g. grid and/or HPC) as part of a holistic training programme on e-Infrastructures

INFRA-2011-1.2.2 : Data infrastructures for e-Science

Indicative budget
EUR 43 million

Funding Scheme

Combination of Collaborative projects and Coordination and Support Actions (CP-CSA) (*addressing Networking activities, Service activities, and Joint Research activities*)

Contact

Krystyna Marek, Carlos Morais Pires

General objective

- General objective:
 - Establish a persistent and robust service infrastructure for scientific data in Europe that responds to the needs of the data-intensive Science of 2020
- More specifically...



Specific Objectives

- a) Deployment of generic services for persistent data storage, access and management that assure data provenance, authenticity and integrity and respond to the needs of advanced user communities (*critical mass*)
- a) Development of an open access, participatory infrastructure for scientific information linking peer-reviewed literature and associated data sets and collections which can be open to non-scientists and to providers of value-added services (*critical mass*)
- a) Scientific community-driven policy development and service deployment for data generation, provenance, quality assessment, certification, curation, annotation, navigation and management so as to promote the sharing of data and the development of trust (*broad scientific communities*)
- a) Development and deployment of tools and techniques for the provision of advanced data services notably for data discovery, mining, visualisation and simulation



Specific Considerations

All proposals are encouraged to:

- (a) consider the international dimension of their activities;
- (b) address education and training;
- (c) address social factors and incentives or rewards that would encourage the use of open data infrastructures by scientists;
- (d) leverage national e-Science initiatives on data;
- (e) foster the use and deployment of open standards and APIs in order to encourage value-added services by third parties;
- (f) set up help/support lines for users where appropriate;
- (g) consider appropriate licensing schemes for open source software;
- (h) address financial sustainability.



Expected Impact (1/2)

- Increased scale of federation and interoperation of data infrastructures
- Better exploitation of synergies with the underlying e-Infrastructures, reduction of costs, increase of the user base and bridging across disciplines, enabling of cross-fertilisation of scientific results and favouring of innovation
- Removal of important obstacles concerning the open access to scientific information and data



Expected Impact (2/2)

- Improvement of preparedness to face the data "tsunami" of the next decade
- Progress towards the vision of open and participatory data-intensive science
- More efficient implementation of clusters of ESFRI projects



Examples of Activities

- Integrating and deploying general ICT services and tools (e.g. by using clouds) for data storage, access, visualisation and long-term preservation to respond to the discipline-specific needs of a range of scientific communities
- Federating institutional, national or discipline repositories that are able to harvest each others' content and metadata, allowing open access for researchers and students to scientific results, both papers and supporting datasets
- Establishing a prototype e-Infrastructure to store journal articles and related datasets, using open standards for metadata exchange, location and cross-citation

Examples of Activities

- Deploying mechanisms for benchmarking the quality, resilience and reliability of repositories
- Clustering existing community-driven information and data management initiatives, in view of developing common data and metadata formats and curation procedures, enlarging the user base and crossing boundaries of disciplines
- Promoting the active use of information repositories with advanced visualisation and annotation tools, which can be of use in educational environments

INFRA-2011-2.3.5 : Second implementation phase of the European High Performance Computing (HPC) service PRACE

Indicative budget
EUR 20 million

Funding Scheme
Combination of Collaborative projects and Coordination and Support Actions (CP-CSA)

Contact
Bernhard Fabianek

Objectives

- Advance in the procurement and deployment of the new eco-system of computational resources with peta-flop performance already started at the first implementation phase and support the porting of applications to the new machines and architectures
- Integrate within PRACE the existing HPC resources shared at European level notably through the DEISA infrastructure



Expected Impact

- Deployment of a state-of-the-art HPC capability in Europe (at peta-scale level from 2010 and moving to exa-scale by 2020)
- Intensive exploitation of the benefits of computing by the European scientific and industrial communities
- Stronger European international position in computational sciences



Examples of Activities

- Support the growing computational and simulation requirements of advanced scientific communities
- Support the simulation needs of industry to boost its innovation capabilities
- Integrate national HPC installations into an European supercomputing infrastructure
- Interlink European computational resources (Tier-0 and Tier-1) with the aim to provide a seamless and efficient service to users
- Continue the DEISA Extreme Computing Initiative (DECI)
- Develop effective mechanisms for joint procurement and joint ownership of machines



INFRA-2011-3.4 : Coordination actions, conferences and studies supporting policy development, including international cooperation, for e-Infrastructures

Indicative budget

EUR 4 million

Funding Scheme

- Coordination Action (CSA-CA)
- Support Action (CSA-SA)

ATTENTION: Formal limits apply to the funding requested by proposers !

Contact

Bernhard Fabianek



Objectives (1/2)

- a) Laying theoretical foundations for e-Infrastructure development, drawing on the development of other infrastructures (≤ 0.5 m€)
- b) Involve teachers and pupils in e-Science to attract the young to scientific careers & Promote the involvement of citizens – including decision makers – in e-Science through the use of e-Infrastructures (≤ 1 m€)
- c) Support an analysis of social and human aspects (including the building of trust) in operating and using the e-Infrastructure (≤ 0.5 m€)



Objectives (2/2)

- a) Encourage the development of skills and curricula for information and data scientists (≤ 0.5 m€)
- b) Promote an analysis and evaluation of possible business models for supporting open science so as to achieve financial sustainability (≤ 0.5 m€)
- c) Support the international cooperation in Research and Education Networking addressing (i) the extension of the European infrastructure to China (≤ 1 m€) and (ii) the feasibility of direct transatlantic connectivity between Europe and Latin America (≤ 0.5 m€)



Expected Impact

- Development of a consistent and dynamic European policy for e-Infrastructures
- Involvement of a broader set of actors in the development, operation and use of e-Infrastructures
- Emergence of sustainable approaches for the provision of cross-disciplinary e-services
- Pooling of resources between e-Infrastructure operators for meeting future scientific needs for international cooperation

INFRA-2011-3.5: Trans-national cooperation among NCPs

Indicative budget
EUR 1 million

Funding Scheme

- Coordination Action (CSA-CA)
- Support Action (CSA-SA)

Contact

Bernhard Fabianek

Objectives

- Support a network of National Contact Points (NCP) for Research Infrastructures, providing value added services across Europe, supporting policy design, exchanging best practices and promoting transnational co-operation
- Proposals are expected to include up to one NCP per country as officially appointed by the relevant national authorities (see the “Guiding principles for setting up of NCP systems for the FP7 for Research and Technological Development”, http://cordis.europa.eu/fp7/ncp_en.html)

Expected Impact

- Lower entry barriers for newcomers to the programme
- Improved efficiency in the design, construction and operation of research infrastructures
- Improved bases for policy development



Examples of Activities

- Maintenance of a repository of data on national and European policies, budgets and programmes on Research Infrastructures per area
- Exchange of best practices among Public Authorities, infrastructure operators and NCPs
- Liaison between the NCP systems in the context of various trans-national activities (data collection, benchmarking, joint workshops, training, twinning schemes)



Examples of Activities

- Practical initiatives to benefit cross-border audiences, such as trans-national brokerage events
- For more examples (e.g. quality assessment of NCP performance) see also the document “Guiding principles for setting up of NCP systems for the FP7 for Research and Technological Development”.

Call 9: Important dates

Tentative timetable

- Call publication: 30.07.2010
- Closing date: 23.11.2010
- Evaluation: Jan 2011 – Feb 2011
- Negotiation: March-May 2011
- Projects start: as of June 2011
- **Contact: INFISO-RI-CALLS@ec.europa.eu**

Further information

http://cordis.europa.eu/fp7/ict/e-infrastructure/calls_en.html



Connecting
the finest
minds

... Linking ideas at
the speed of light

Sharing the
best scientific
resources

... Harnessing
the unlimited power
of computers,
instruments and data

Building virtual
global research
communities

... Innovating the
scientific process



e-infrastructure



géant | grids | scientific data | supercomputing



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