



## **Report of the 4<sup>th</sup> e-Infrastructure Concertation Meeting 5-6 December 2007, Sophia Antipolis, France**

**Content:**

Report of the 4th e-Infrastructure Concertation Meeting , co-organised by the European Commission - DG INFSO/F3-GÉANT & e-Infrastructure with the support of ETSI, the European Telecommunications Standards Institute, which took place on 5-6 December 2007 in Sophia Antipolis, France.



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**Log of Changes**

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## 1. Introduction

### 1.1. Executive Summary

This is a report on the 4th e-Infrastructure Concertation Meeting, co-organised by the European Commission - DG INFSO/F3-GÉANT & e-Infrastructure with the support of ETSI, the European Telecommunications Standards Institute. This two-day meeting took place on 5–6 December 2007 in Sophia Antipolis, France at the ETSI Headquarters.

The purpose of this document is to present the objectives and main outcomes of the event. The structure of the document is the following:

- An overview of the event and its objectives, as well as information about attendance
- The collection of key messages from the speakers at the event opening
- Brief overview of the attending projects and their presentations
- The collection of key findings from the individual tracks
- The collection of key findings from the plenary sessions
- A summary and a brief analysis of the answers to the public web questionnaire circulated among experts and research institutions in preparation for the meeting
- A summary of the standards used by attending projects
- Compilation of main conclusions and actions

The most relevant actions to be taken at project level can be summarised as follows:

- Projects were encouraged to establish an easy way (e.g. a web page) to disseminate relevant information on its standardisation related work, the contact persons, open issues, requirements and needs.
- Each project was also requested to report on follow up actions to this 4th eConcertation Workshop in their next activity reports and reviews.
- Projects were asked to play an active role in identifying their major standardisation needs at an early stage.
- Supporting projects like BELIEF are invited to gather and maintain live documents, information and standard-projects matrices and to create a mailing list on e-Infrastructures standards related topics;
- Projects like OMII-Europe, already heavily involved with standards and providing tailor-made training courses could be contacted to take advantage of these training courses.
- Closer collaboration, exchange of experiences and results achieved among projects is considered beneficial and should be enhanced. The reinforcement of human networking and synergies among stakeholders should be developed in order to facilitate the production, deployment and use of standards. In this context, an important catalyser role is expected from supporting projects like OGF-EUROPE, GLOBAL, GridTalk and BELIEF-II.

The reporting has been carried out by BELIEF (<http://www.beliefproject.org/>), an EU funded project under the 6th Framework Programme. A one-stop home for public e-Infrastructures documentation, the project aimed to encourage the effective development and exploitation of



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e-Infrastructures by communicating between e-Infrastructure initiatives and new user communities. The project played also a very active role in disseminating the EU e-Infrastructures projects internationally, especially in India and Latin America.

All presentations given at the event can be freely accessed in the BELIEF Digital Library, a repository of international e-Infrastructures documentation, at <http://belief-dl.isti.cnr.it/>, browsing the collection “Initiatives and Organizations - eConcertation”.

The organisers would like to express their utmost appreciation to Dr. Wolfram Horstmann from Bielefeld University, Dr. Alistair Dunlop from Southampton University and Dr. Martin Potts from Martel who jointly analysed the web questionnaires, acted as rapporteurs at the event, and valuably contributed to the production of this report.



## 1.2. Background of the 4th e-Infrastructure Concertation Meeting

The European Union has a great interest in developing effective standards and, since the mid-1980s, has promoted them by supporting related projects, policies and legislation. The New Approach and European standardisation strongly contributed to the development of the Single Market. The success of the European standardisation system has played a vital role in removing technical barriers to trade by ensuring the free movement of goods between Member States.

Nowadays, Information and Communication Technology services and applications play a key role in the global economy and have become part of everyday life of common citizens.

The legal basis for European standardisation, including the ICT domain, is Directive 98/34/EC. One of its main elements is constituted by the formal recognition of three European Standards Organisations, CEN (European Committee for Standardisation, [CEN]), CENELEC (European Committee for Electrotechnical Standardisation, [CENELEC]) and ETSI (European Telecommunications Standards Institute, [ETSI]), active in the ICT domain. ICT standardisation is a part of the general standardisation activities, and contributes to policy objectives to improve the competitiveness of European industry, as specified in the Lisbon strategy. In order to assure the promotion of competitiveness of European industry and a better interoperability between the EU industry and the external world, the European ICT standardisation policy has been implemented. Recently, the EC launched a study on "The specific policy needs for ICT standardisation" to analyse the current state of European ICT standardisation policy and to present recommendations for future steps.

In the light of the increasing importance of standardisation process mentioned above, the European Commission - DG INFSO/F3-GÉANT & e-Infrastructure has planned its closer cooperation with the major EU standardisation bodies and EU-funded projects involved in standardization activities, to help effective development and wider use of EU e-Infrastructures.

E-Infrastructures are already having a dramatic impact on the world of research, not only within, but also outside the scientific community, by providing global platforms for innovation and business development in a way reminiscent of the World Wide Web. e-Infrastructures will seamlessly connect technologies and their components, and thus increasingly connect the ideas and work of many researchers across the world in a global virtual research community. They will help in sharing knowledge and best practices, spur innovation in commercial applications and release the tremendous potential of the world's greatest minds working together.

However these e-Infrastructures are as valuable as the people using them and standards are a pre-requisite for their fast and widespread adoption by researchers, whether in academia or business, to advance scientific knowledge and accelerate innovation.

As one example of e-Infrastructures, Grid computing is approaching a degree of maturity that makes it ready for adoption, further development, and exploitation by the commercial sector. In this light, the computing industry must develop tools for the new environments and increase standardisation efforts for faster and more rational use of e-Infrastructures.



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Although there are many standards-issuing organisations, there remains much to do: some standards<sup>1</sup> in specific contexts do not necessarily have universal acceptance and consensus, and very often different scientific contexts issue competing and conflicting standards<sup>2</sup>.

For basic concepts and information used in this section please refer to [CORDIS], [EUSTANDPOL] and [ICTSTD].

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<sup>1</sup> The concept of *standard* is a universally consensus-based set of guidelines and specifications for the implementation of interoperable systems.

<sup>2</sup> When speaking of “open” standard we tend to refer to a standard that is publicly available and that is usually restricted to royalty-free technologies. The term "standard" however is sometimes restricted to technologies approved by formalized committees that are open to participation by all interested parties and operate on a consensus basis. Sometimes the term "open standard" is strictly related to "open source", implying the idea that a standard is not truly open if it does not have a complete free/open source reference implementation available.



## Meeting Overview

### 1.3. Objectives of the 4th e-Infrastructure Concertation Meeting

The e-Concertation meeting in Sophia Antipolis aimed to provide an overview of standardisation in Europe, to identifying priority areas for standardization, and thus to help its e-Infrastructures stakeholders share a common goal for standards and the best ways to reach it. The event focused on the role of standards in accelerating research and the process of adopting research results and in supporting interoperability and the integration of research infrastructures, while linking e-Infrastructures' evolution with industry needs and objectives.

The meeting aimed also to address the role of researchers in the process of standards development, provide input to broader European policies on standards and to foster development of synergies among e-Infrastructure projects as well as among projects from related research areas.

Another important goal of the event was also to highlight the key role of standards and interoperability in fostering international cooperation for e-Infrastructures development and adoption, as well pointed out by Dr. Kyriakos Baxevanidis in his presentation, which also focused on the importance of creating a critical mass upon issues of strategic importance in order to increase their impact. The importance of validating the existing standards in order to apply them in novel application scenarios was also a key objective of the meeting together with the encouragement to the main stakeholders, project coordinators and policy makers to provide input to EU standardisation policies.

Further details can be found at [ETSIECONC].

### 1.4. Overview of the agenda

The 4th e-Infrastructure Concertation Meeting was organised as a two-day stand-alone event, and it took place in Sophia Antipolis, on 5-6 December 2007.

Kindly hosted by ETSI (<http://www.etsi.org>) and sponsored by CISCO (<http://www.cisco.com>), ERCIM (the European Research Consortium for Informatics and Mathematics - <http://www.ercim.org>) and ETSI, the event focused on the role of standards in accelerating research and the process of adopting research results.

The event started with the welcome and opening addresses given by Dr. Dany Vandromme, Director of GIP Renater and French representative to ESFRI and e-IRG, by Jorgen Friis, Deputy Director-General, ETSI and Dr. Kyriakos Baxevanidis, Deputy Head in the Unit of Research Infrastructures, who explained the users needs in terms of standards and pointed out that interoperability and standards are keys to success (see Section 2.1).

Further to the welcome address, the event saw three interesting keynote speeches given respectively by Dr. Ultan Mulligan, Strategy and new Initiatives Director of ETSI, by Prof. Dr. Wolfgang Gentzsch, Director of D-Grid Germany and Steve Crumb, Executive Director and VP of Operations for the Open Grid Forum. These presentations will be briefly described in paragraph 2.1.

After the networking lunch, kindly sponsored by ETSI, the e-Infrastructures Concertation Plenary session, chaired by Dr. Baxevanidis, offered the new FP7 project's (funded in the 1<sup>st</sup> call of Proposal) representatives the opportunity to briefly provide an overview of their





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projects and their involvement in terms of standardisation. As mentioned above, all project's presentations will be briefly described in paragraph 2.2.

Before the event, a public web questionnaire was prepared and sent to experts and researchers, most of them also participants in the event, who were invited to answer about their perception and experiences of standardization processes. The results of these web questionnaires were jointly analysed by Dr. Wolfram Horstmann from Bielefeld University, Dr. Alistair Dunlop from Southampton University and Dr. Martin Potts from Martel.

These experts acted also as rapporteurs for three parallel tracks on Data, Middleware and Networking, which took place after the coffee break and ended just before the cocktail, sponsored by CISCO, which concluded the first day of the event. During these parallel tracks, the chairs, together with the respective EC Project Officers, offered an overview of the main outcomes of these questionnaires, which were in more details analysed the morning after during the respective report sessions, the metrics in Appendix 6.4 were filled in, and identified future steps and actions to be taken. The results of the questionnaires and metrics clearly provided an overview of the state of the art in terms of projects already heavily involved in standards. These results stimulated a discussion between the audience and the chairs and showed a little percentage of standards "sceptical" among the participants.

The second day was fully dedicated in the morning to a Plenary session chaired by Dr. Baxevanidis and to the main results and outcomes of the three parallel tracks summarised by the respective chairs, which will be described in more details in paragraph 2.3. The event was concluded by ETSI experts whom offered an overview of the ETSI experience and results achieved please see paragraph 2.4.

The Conclusion session with the main outcomes of the event was driven by Mr. Kyriakos Baxevanidis and is summarised in Section 4.

The Agenda of the event can be found in Appendix 6.1.

## **1.5. Participants**

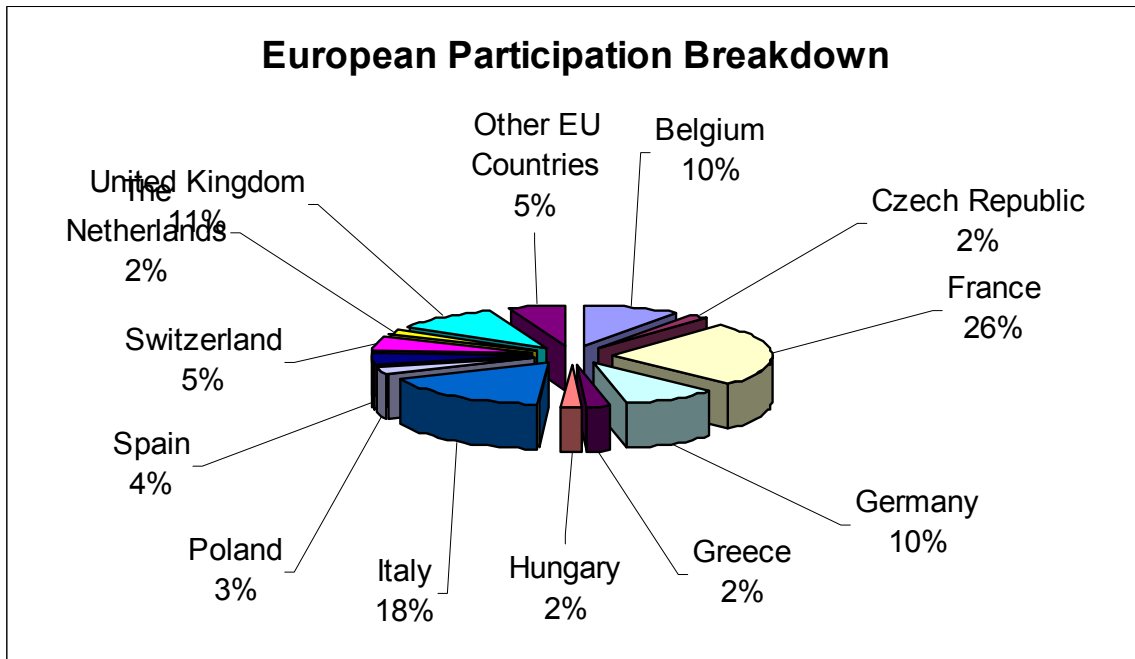
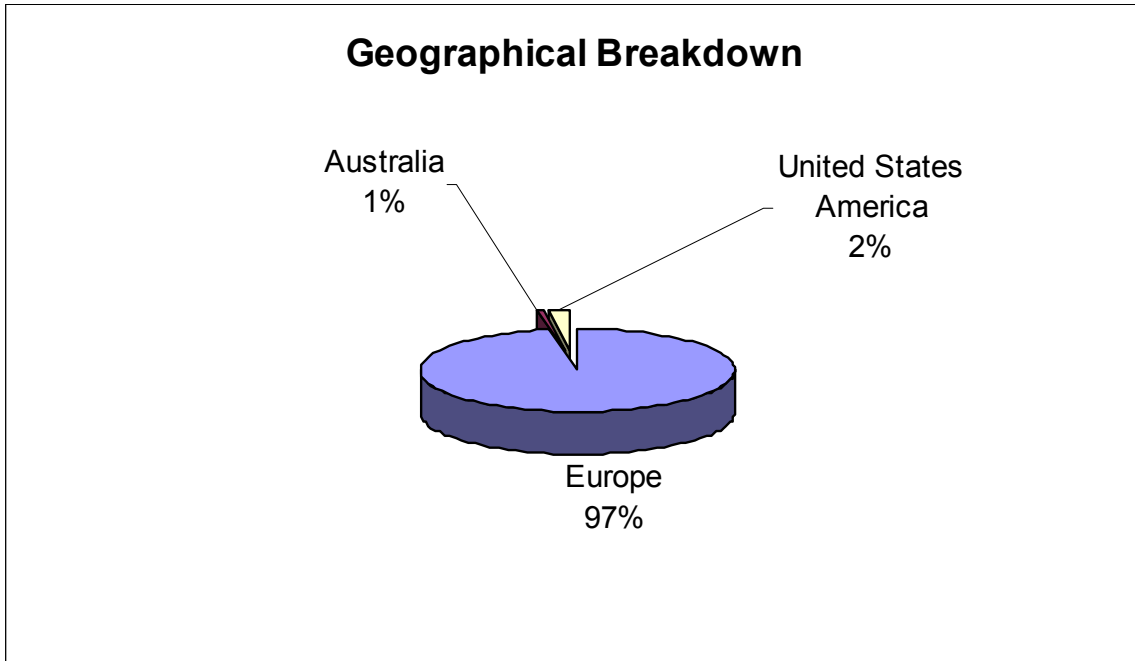
The 4<sup>th</sup> e- Infrastructures Concertation Meeting was by-invitation only and engaged about 100 experts mainly from Europe, including business leaders, ETSI representatives, technology researchers and EU projects' coordinators, EC Projects Officers, as well as current and potential users and providers of e-Infrastructures standards.

The participants were from a range of different technological and scientific backgrounds. This helped to paint a picture of the different roles of the many researchers involved in the process of standards development and thus to identify priority areas for standardization in the future development of e-Infrastructures.

The participants list can be found in Appendix 6.2.



The graphs below show respectively the geographical breakdown between European and non-European participants and among Europeans.





## 2. Contributions and Discussion Groups

### 2.1. Opening and keynote speeches

As mentioned in paragraph 1.4, the event opened with introducing speeches from Dr. Dany Vandromme, Director at GIP RENATER (Réseau National de télécommunications pour la Technologie l'Enseignement et la Recherche), French representative to ESFRI and e-IRG, Dr. Jorgen Friis Deputy Director-General of ETSI and from Dr. Kyriakos Baxevanidis, Deputy Head, Unit of Research Infrastructures of the European Commission, DG Information Society and Media.

They respectively gave an overview of the expectations on the use of e-Infrastructures from a user-oriented point of view, and outlined the importance of standards as an essential EU strategy element in the construction of global virtual research communities.

Dr. Baxevanidis then introduced the leading objectives of the meeting, addressing the role of standards in the context of the development and deployment of e-Infrastructures (Cyberinfrastructure, i-Infrastructure, etc.) and emphasizing the specific role of research in this context.

In his introduction Dr. Baxevanidis pointed out the most relevant issues to be covered:

- The identification of priority areas of standardisation in relation to current status and evolution path of e-Infrastructure.
- The creation of synergies among projects belonging to both e-Infrastructure and other areas, with emphasis on standards development and impact.
- The key role of standards and interoperability in the development of international cooperation for e-Infrastructures development and adoption.

He also depicted the expected output of the workshop, focusing on:

- Concrete synergistic actions to be taken between projects, like joint technical developments, horizontal working groups on topics of common interest, common deliverables and/or papers, collective dissemination actions and material, sharing of training material, etc..
- Willingness of projects to report on the above activities in the follow-up of the eConcertation events.
- The need of mechanisms for the identification of standards with broad interest; and for achieving an increased input to and interaction with standardisation fora and bodies.
- The need of a framework on regular reporting by projects on standardisation aspects (e.g. following a common paper/web format to facilitate synergy).
- The need and opportunity to provide input to EU standardisation policies.

The invited speeches were the following:

Dr. Ultan Mulligan, Strategy and New Initiatives Director, ETSI, speaking on “*Bridging the Gap between Research and Standards*”.

Dr. Mulligan highlighted the importance of standards in encouraging innovative cooperation, lowering production costs, transform good scientific and technical ideas into commercial success. He then focused on the problem of identifying the main causes of the gap between



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research projects and standardisation and outlined a number of guidelines, best practices and tools to reduce such a gap, based on the actual experience of ETSI.

Prof. Dr. Wolfgang Gentzsch, D-Grid general co-ordinator, speaking on “*Grid Infrastructures and Standards – The example of D-Grid*”.

One of the specialties in D-Grid is -for historical reasons- the utilisation of all three major grid middlewares gLite, Globus, and Unicore. To enable widest acceptance of the D-Grid e-Infrastructure, all major D-Grid resources are equipped with this middleware stack. The major result of the first implementation phase is that important functionalities of the three middlewares can interoperate. This result, however, is not easily scalable towards a flexible, dynamic infrastructure. Interoperability is needed for this, based on standard interfaces. Therefore, versions of the middlewares based on standards are required. The presentation demonstrated this evolution from simple interoperation to interoperability based on standards.

Dr. Steve Crumb, Executive Director and VP of Operations for the Open Grid Forum, introducing the OGF vision and mission about (open) standards.

The mission of the OGF is to accelerate the adoption of Grid by providing an open forum for Grid innovation and developing open standards for Grid software interoperability. Starting from this point, Dr. Crumb highlighted how Grids and e-Infrastructures have enabled increased productivity giving actual examples. Then he introduced a stepwise strategy for the pervasive adoption of e-Infrastructures demonstrating why standards are a critical factor in this process and how they can act as a facilitating factor.



## 2.2. Projects' presentations

In the plenary session, short presentations from the e-Infrastructure projects funded in the first call for proposals (expected to be launched by the end of 2007 or beginning of 2008) were given. The presentations provided a brief overview of the projects themselves, their Consortium members, their goals and their involvement with standards.

The following four areas were covered/represented:

- Scientific digital repositories (IMPACT, NMDB, DRIVER-II, METAFOR, EuroVO-AIDA, GENESI-DR)
- Deployment of eInfrastructures for Scientific Communities (FEDERICA, EUFORIA, neuGRID, D4Science, EDGeS, ETSF, e-NMR, DORII, SEEGRID-SCI, EVALSO)
- New research infrastructures (PRACE)
- Design studies (EGI-DS, DIESIS)

### Scientific Digital Repositories

**IMPACT**- *Sarah Hunter, EMBL-EBI, European Bioinformatics Institute*

The project's objective is to create, annotate & integrate statistical models (a.k.a. "signatures"; HMMs, Profiles or FingerPrints) which represent the functional domains or features of proteins. It is very important that data storage and easy and fast communications exchange are assured. In this light definition of data exchange format standards and web services standards are important tools. Web services will be used internally within the consortium to ease data exchange and streamline data production pipelines. The aforementioned areas will be the most affected by standards.

**NMDB (Neutron Monitor Database)** - *Koen Stegen, Belgian Institute for Space Aeronomy*

The project's objectives are easier access to NM Data, Applications and Training and public outreach. Standards related include common metadata structure and common interfaces to assure interoperability.

**DRIVER-II (Digital Repository Infrastructure Vision for European Research)** - *Michael Hatzopoulos, University of Athens*

Among the project's objectives there is a plan of building a Confederation of European digital repositories and with regards to data to extend the virtual Information Space over multiple and heterogeneous repositories. In terms of networking activities the creation of the above mentioned confederation of digital repositories and to ensure that DRIVER's controlled geographical and thematic extension and maintain relationship between research activities and communities. Standards related work:

- Data and Metadata Models
- Repository-GRID interactions
- Repository interoperability
- Long-term preservation technologies



- Representation of complex scientific objects
- Transfer of digital objects

**METAFOR (Common Metadata for Climate Modelling Digital Repositories)** - *Lois Steenman-Clark, NCAS, University of Reading, UK*

One of the major goals of this project is to create an Information Model that is common for all stages of both production and the use of climate model data. The open standard developed in METAFOR will play a catalytic role in the way next generation climate data repositories, such as IPCC AR5\*, are organised, preserved and accessed. This project aims to coordinate the filling of the metadata gaps, mapping to different standards, aggregating the metadata and, if necessary, creating new standards.

**EuroVO-AIDA (Euro-VO Astronomical Infrastructure for Data Access)** - *Françoise Genova CDS, CNRS & ULP*

The Virtual Observatory aim is to provide astronomers with seamless access to data, information, services and tools—a world-wide endeavour. With regards to standards a special focus will be given to evolution of VObs interoperability standards, Data Access protocols and Data Models. VObs standardizing body: International Virtual Observatory Alliance Semantics, Data Models, Data Access Layer, Query Language, Registry, Grid & Web services, et al..

**GENESI-DR (Ground European Network for Earth Science Interoperations - Digital Repositories)** - *Joost van Bemmelen, ESA*

This project aims to provide reliable, easy, effective access to PB's of heterogeneous earth science data and to harmonise data access operations. In order to achieve the project's goals to demonstrate data curation, prepare for long term preservation, to validate DR access capabilities for new communities, including education and to integrate emerging technological paradigms in operational infrastructures responding to emerging requirements standards are compulsory.

## 2.2.1. Deployment of e-Infrastructures for Scientific Communities

**FEDERICA-** *Mauro Campanella, GARR Italy*

This project objectives' includes supporting research on new Internet architectures and protocols, to create an European wide "technology agnostic" infrastructure based on a mesh of 1 Gb/s MPLS tunnels and circuits from NREN/GEANT and virtualisation nodes providing virtualized network/computing facilities (in form of "slices") to end-users.

It also aims to allowing disruptive emulations, to open to host researchers' hardware and applications and to provide full control of the network up the data link layer (later lower layers) and access to monitoring data.

The Consortium seeks to exploit at their best the existing NREN/GEANT networks and tools. Their approach towards standards is through early prototyping of standards, including protocols, and their validation through selected end-users in the production environment. The focus is on the user in a bottom-up, horizontal approach. A particular focus is on multidomain and end-to-end communication.



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**EUFORIA (EU Fusion for Iter Applications)** - *Dr. Isabel Campos, Cantabria Institute of Physics-IFCA, Spain*

The main objectives of the EUFORIA project are the deployment of Grid and HPC infrastructure, the adaptation and optimisation of Fusion Codes and the development of advanced tools for Workflow management, Visualization tools and Data mining. This project is already heavily involved in the use of Globus and UNICORE standards.

**NeuGRID** - *Giovanni B. Frisoni, National Alzheimer's Centre Fatebenefratelli, Italy*

The NeuGrid project is a Grid enabled data mining project to analyze the Alzheimer's disease. Also this project is already familiar with the use of standard in the medical field.

**EDGeS (Enabling Desktop Grids for e-Science)** - *Peter Kacsuk, Computer and Automation Research Institute of the Hungarian Academy of Sciences*

The main objective of EDGeS is to support new communities by providing the necessary extensions for existing Grid infrastructures to address the specific needs in these new scientific communities regardless of the location of their research facilities and to extend the potential user communities for both Grids and Desktop Grids beyond traditional scientists and current volunteer computing participants to further involve ordinary citizens, secondary school students, and company employees, giving them an opportunity to become involved in science and to apply Grid technology in their every day life. This project would like contribute to several Grid and P2P standards bodies.

**ETSF (The European Theoretical Spectroscopy Facility)** - *Yann Pouillon, Universidad del Pais Vasco*

Within the ETSF, its Consortium aims to broaden the access to the knowledge and the expertise built in the field of theoretical spectroscopy across the public and private sector. ETSF offers several scientific codes that translate state-of-the-art methods into tools to study the properties of real materials. Scientific programmers and software engineers support ETSF researchers in developing efficient, user-friendly, and well-documented codes.

**DORII (Deployment of Remote Instrumentation Infrastructure)** - *Norbert Meyer and Marcin Plóciennik, PSNC, Poland*

This project aims to deploy remote instrumentation infrastructures and among other objectives it will promote standardisation and knowledge transfer via e-IRG and OGF research groups.

**SEE-GRID-SCI** - *Emanouil Atanassov, Institute for Parallel Processing Bulgarian Academy of Sciences*

Further to the very positive first and second phase of this Balkan project, SEE-GRID-SCI aims to foster the engagement of international user communities and providing application-specific service extensions. The Consortium seeks to fulfil the project's goal by providing infrastructure for new communities and by strengthening the regional and national human network. Another important goal is to consolidate actions towards long-term sustainability and European Grid Initiative inclusion.

**EVALSO (Enabling Virtual Access to Latin-America Southern Observatories)** - *Fernando Liello, University of Trieste, Italy*





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The project's role is to enabling Virtual Access to Latin-America Southern Observatories. World-class experimental facilities are often placed in remote sites which makes the exploitation of these facilities socially and economically difficult. European research community depends on these facilities to maintain its role and in this light networking technologies can play a significant role. This project will use existing standards when applicable.

### 2.2.2. New research infrastructures

**PRACE (Partnership for Advanced Computing in Europe)** - *Thomas Eickermann JSC - Jülich Supercomputing Centre, Research Centre Jülich, Germany*

PRACE will provide researchers in Europe with access to world class supercomputers. PRACE also intends to work in close collaboration with other European research infrastructures, notably those in the comprehensive ESFRI road map. In order to ensure the seamless internetworking of key European research infrastructures, contacts have been established with Distributed European Infrastructure for Supercomputing Applications (DEISA), European Grid Initiative (EGI), HPC-Europa, Open Middleware Infrastructure Institute- Europe(OMII-Europe). PRACE also acknowledges the contributions made by the ESFRI and e-IRG panels to help in early stages, notably when setting up the HPC in Europe Task Force in 2006.

### 2.2.3. Design studies

**EGI-DS (European Grid Initiative Design Study)** - *Dieter Kranzlmüller, GUP Linz, Austria*

This project aims to ensure the long-term sustainability of the European eInfrastructure, to coordinate the integration and interaction between National Grid Infrastructures and to operate the European level of the production Grid infrastructure for a wide range of scientific disciplines to link National Grid Infrastructures. With regards to standardisation the EGI Design Study will assure interoperability between NGIs ("NGIs should contribute and adhere to international standards and policies") and interoperability between different grid middlewares. It will collaborate with OGF and OGF Europe.

**DIESIS (Design of an Interoperable European federated Simulation network for critical Infrastructures)** - *Alberto Tofani, ENEA Italy*

This project aims to develop an extensible ontology and communication protocols for Critical Infrastructures (CI) federated simulation and to design an IT-architecture supporting federated, interoperable simulations. Another goal is to develop a strategy and roadmap to strengthen e-Infrastructures. It will be using existing related standards:

- High Level Architecture (HLA) by IEEE
- Distributed Interactive Simulations set of standards (DIS) by IEEE





## 2.3. Parallel Tracks

Three working groups were set up by gathering experts and projects' representatives according to their different areas of expertise: Data, Middleware and Networking. They aimed to analyse questionnaire results, hold in-depth discussion on topics of broader interest in the area of standards, synergies and policy and to report on their work on a standards (under development or desired).

The groups were formed as follows.

**Data Projects:** IMPACT, NMDB, DRIVER, DRIVER II, METAFOR, EuroVO-DCA, EuroVO-AIDA, GENESI-DR, D4Science, DILIGENT.

**Middleware Projects:** Chemomentum, DEGREE, EC-GIN, GridCC, KnowARC, QosCosGrid, SIMDAT, BalticGrid, BELIEF, BIOINFOGRID, CYCLOPS, DEISA, eDEISA, EELA, EGEE-II, e-IRGSP, ETICS, EUChinaGRID, EUIndiaGRID, EUMEDGRID, EuroVO-DCA, ICEAGE, int.eu.grid, ISSeG, ITHANET, OMIIEurope, RINGrid, SEE-Grid-2, DIESIS, DORII, EDGeS, EGI\_DS, e-NMR, ETSF, EUFORIA, neuGRID, PRACE, SEE-GRID-SCI.

**Networking Projects:** 6DISS, EuroLabs, PHOSPHORUS, AUGERACCESS, EXPreS, GN2, Go4it, SEEREN2, Federica, EVALSO, OCCASION, ORIENT, MUPBED, PORTA OPTICA, SEEFIRE, ALICE, TEIN2, EUMEDCONNECT, WEIRD, LOBSTER.

After a broad and deep discussion, outcomes of the tracks were reported in a plenary session. They are summarized in the three following sections.

The summary of standards used by the attending projects can be found in Appendix 6.4.

### 2.3.1. Data (Scientific Data Infrastructures)

Scientific Data Infrastructures constitute a new field in FP7 which attracted a wide variety of scientific communities: from bioinformatics and space physics to climatology etc.

It envisages capacity building in the area of data management, including enhanced access, curation and preservation. The active involvement of scientific communities will be a key element for the standardization envisioned at later stages.

On the policy side, the Council of the EU for Competitiveness (Internal Market, Industry and Research) recently adopted "Council Conclusions on scientific information in the digital age: access, dissemination and preservation" (2832<sup>nd</sup> meeting in Brussels on 22 and 23 November 2007).

The conclusions are of key relevance to reinforce Europe's active role in modern science and research as they highlight the need to provide widespread access to scientific information – *publications and data* and to set up mechanisms to ensure its preservation.

The standardisation issues in the area of information and data span across different stages of the scientific process: collection of raw experimental data and its validation until the phase of dissemination of the knowledge built through scholar communication (papers, articles, etc).

The meeting helped to understand that standardisation is more urgent to certain communities than to others. Furthermore, the discussion brought to the table the differences in terms of standardisation requirements according to the scientific area.



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The scientific communities often have to address a considerable level of complexity in dealing with data and its management. For example, they have to face specific, heterogeneous provenance of data and the fact that their members are both users and developers of standards.

Metadata, and Data Formats are key issues for this area. Already for many years communities collected huge amounts of data which was annotated with ancillary information (metadata). Therefore, the management of legacy data is a major issue which brings forward the need to overcome proprietary encoding used in the past (vendor-driven). This is in fact directly related with the fast-evolution of ICT products which makes standardisation even more difficult.

Another key concept is interoperability. The aspects of interoperability are somehow distinct from the other areas (middleware and networking) because of the very specific problems which differ from community to community.

Heterogeneity of formats should not be considered the main problem since it can be solved via conversion tools. Moreover, standardisation could be tackled with an *a-posteriori* process and appropriate tools. This should also lead to careful consideration of the use of standards when facing issues related to usage and preservation and the relationships with actual requirements and sustainability.

Another notion highlighted during this session was the “division of labour” between researchers and members of the user communities. For example, preservation should be responsibility of data-centres and data producers, while curation and quality control requires the collaboration with researchers, etc.

As far as expectations on data interoperability and standards are concerned, different 'scientific communities' focus mainly on defining interfaces (Application Programming Interfaces - API) with the underlying layers (simulation, storage, grids, networks, etc) rather than on the standardisation of tools and technologies. In other words, one of the main expected advantages for the users of scientific repositories will be the virtualisation of resources and its usage in a transparent way adapted to heterogeneous workflows supporting the scientific process. All projects had the opportunity to identify main standardisation bodies and specifications that are relevant for their work.

Finally, further knowledge exchange was considered important by all attendees. A forum, a website, mailing lists, workshops, etc., could be good solutions to improve the exchange of ideas and best practice sharing.

### **2.3.2. Middleware**

Almost all middleware projects attending this track are involved to some extent with OGF specifications and/or standards. Given the number of middleware projects, the European community as a whole is in a very strong position to influence or even direct the standardisation process. What is also clear is that almost all Grid Middleware standardisation activities are being taken through the OGF rather than any other standardisation body.

A relevant warning raised during the discussion is that caution should be used against “standards euphoria”, meaning the risk that any time researchers and/or industries face a problem they try to solve it by creating a standard. The problem should try to be solved with



the available tools and technologies and the standards should emerge as a consequence of the ongoing work and dialogue with other solving similar problems. Standards should be considered as a means to achieve the end goal in the most effective way. Thus, they can be put forward as solutions to problems start being found.

An important question arose from projects with user communities – which invariably involve the use of domain specific standards – whether there is really a value for the user communities for putting effort into the global use of these standards. In fact, many user communities are sceptical of the value of providing input to the standards activities beyond their particular discipline. This is a very important aspect as wider use of the Grid Infrastructure requires greater involvement from the scientific community. Simply providing a computing resource only addresses the needs of a very small part of the scientific community. To truly utilise the provided e-Infrastructures requires leveraging the involvement of other users of the infrastructure. This implies re-using of data and or analysis. Ensuring that the domain standards of user communities are accommodated within e-Infrastructures is therefore seen as critical for their long term success.

Analysing the results of the questionnaire, it is evidenced that projects' involvement in standards is variable, ranging as follows:

- Significant role (Chair, Co-Chair, Secretary, etc.) in driving the standardisation/specification process
- Participant in the definition of the specification
- Implementing the specification
- Using the specification
- Considering/thinking that a specification/standard may be needed

Deriving from this, we should suggest that projects need to clearly state their level of participation/expected participation in the standards and should only claim use of a standard if they have to interface directly to the standard (see Appendix 6.4). It is important that we look at a common way of creating standards to help solve a problem. If the standards are not solving the problem we should not create new standards.

Finally, another question arose about future steps which should be taken. There are no substitutes for attending OGF standards meeting - it takes a lot of commitment and effort to attend. There are also high overheads, but more OGF meetings in Europe are expected facilitated by the OGF-EUROPE project which should reduce some of these overheads. Efforts also need to be put in place to engage users with their own domain specific standards to ensure that their data and results are compatible/integrated into the middleware fabric.

This session also offered the audience some information about OMII-Europe project and its extensive engagement in driving the standards. OMII-Europe can also support training in any of the broad interest standards, and where appropriate, could represent projects in standards discussions.

### 2.3.3. Networking

In this track an in-depth discussion about the value of standardisation took place, mainly starting from the consideration that standardisation involves a commitment in terms of time and costs which must be adequately compensated by the potential rewards. A balance between investing in developing a standard or buying a product later with the standard built-in must be accurately evaluated, taking into account the lifetime of the resulting product.



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Furthermore, organisations have to consider how to industrialise the solution, exploit the IPR behind the standards, and reuse them in different environments.

It is worthwhile noting that whilst for some issues there is an awareness of the need for standards (resolving current problems, achieving interoperability, expanding the size of the market, etc.), in other areas there are some issues to overcome for people to realise there is a need for standards; widespread de facto (proprietary) solutions can also yield high profits.

A number of pre-requisites for producing successful standards were identified, e.g. having a critical mass coming either from a strong specific group of players or from a wide cross-community.

Regarding the process of standardisation, the question of what type of standard to go for was specifically considered, given the difference between bodies such as ITU (International Telecommunication Union) versus IETF (Internet Engineering Task Force): the former requiring a long process, but stable for several years; the latter being faster, but more dynamic. This leads to the importance of targeting the right standard development organization.

Moreover, the importance of early prototyping and testing was recognized. This enables assessment of the concepts and validate the specifications. Other success factors are the openness of the process of standardisation (not restricted by membership conditions such as type of organisation or by high fees), the openness of the resultant standard, the necessity of industry involvement and of evolving the standard, once produced.

Finally, it was agreed on the importance of identifying in the early stages of a project the standards that will be used, or need to be developed, as well as to disseminate about what standards work is being done in projects (to attract support, build communities, avoid duplication, identifying potential users in other areas, etc.).

The importance of being aware of the non-technical factors associated with standardisation was also evidenced, such as setting expectations at the right level and being aware of the potential resistance (especially when market issues are at stake). The standards situation is considered to be improving, but in each case it will be a commercial decision whether to spend the effort.

All the projects' representatives attending the networking group were familiar with the routes to standardisation; they required openness to the mechanisms and results, and declared their interest in, among other things, supporting and/or validating standards through prototyping and testing.

## 2.4. Experiences and demonstrations

These two plenary sessions benefit from the wide experience matured so far by the invited speakers mainly on Grid models, development and test methodologies and test beds implementation.

Denis Caromel (INRIA) and Laurent Vreck (ETSI) gave an exhaustive overview of the GCM (Grid Component Model) and focused on the GCM Interoperability Deployment, stressing its capability of describing Components and Deployment in a standard manner and to be used as building blocks for Grid applications, targeting different Grid frameworks.

Dieter Hogrefe (ETSI) presented the ETSI experience in supporting standardization with methodologies, focusing on standards for testing and specification methods. He gave a deep look into issues related to protocol specification, testing, technical quality (e.g. validation,



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consistency, test suite structure), as long as to the identification and definition of advanced specification and testing methodologies. Finally, he gave an overview of ETSI's IPv6 testing project and IPv6 test suite development methodology.

Anthony Wiles (ETSI) illustrated the ETSI approach to interoperability, going through the different levels and related standards to be taken in account when designing, implementing and testing components aimed to interoperate in a complex system.

Sebastien Muller (ETSI) presented the most relevant characteristics of the IPv6 test bed as an example of how the development of a standard is strictly related to the application, in turn, of standardised methods for the test design and validation of a world wide system, focusing on issues related to conformance and interoperability testing.

Péter Krémer (ETSI) and Theofanis Vassiliou-Gioles (Testing Technologies) gave a wide introduction of the principles, implementation and use of the TTCN-3 standard (Testing and Test Control Notation Version 3).

Franck Le Gall (Go4IT Project) presented the experience of the Go4IT Project, a success story demonstrating on one hand the effectiveness of the standardised TTCN-3 test methods to deliver IPv6 oriented test tools, test suites and the related services. On the other hand it demonstrates the key role of interoperability standards in a number of world wide systems and applications.

### 3. Overview of the Questionnaire and of the Results

As briefly mentioned in paragraph 1.4, in preparation of the event, the European Commission – DG INFSO – Unit F3 e-Infrastructure in collaboration with ETSI realised a web questionnaire focused to gather information on the European research, development and usage of e-Infrastructures applied in scientific area to identify priority areas of standardisation in relation to current status and evolution path of e-Infrastructure.

The constituency contacted for the answering was composed by personnel involved in 60 European FP6/FP7 project from the e-Infrastructure portfolio. 138 valid answers were received during answering timeframe (out of 149 overall). The detailed results of the survey are presented in Annex 1. Hereafter the content of the questionnaire is presented along with a summary of the results.

The questionnaire (see also Appendix 6.3 - The Questionnaire) is structured in 4 main parts:

- The first part gathers information on the demographic of the sample intending to qualify the following information: scientific areas, types of organisation (public/private), types of research (applied/fundamental) and types of intervention in e-infrastructures (user/developer) of the various communities.
- The second section is dedicated to **user part** of the panel and asks questions on: the needs in networking, grids computing, data infrastructure and application. The questions took into account the impact of the project into the standardisation process trying to point out the benefits of standardisation for the user communities.
- The third set of questions was targeted to the **developer part** of the panel asking questions on: the layer of developing e-Infrastructures (networking, grids, data, and application), the geographical footprint of the standards the panel is working on; the benefit of standardisation process for the developers; the European projects generated outputs on standardisation.



- The fourth part asked open questions on: the most urgent needs on standardisation, the most relevant standardisation bodies and to have suggestions for addressing the projects' interest and cooperation in standardisation.

From the whole set of results it is worthwhile highlighting some figures regarding the demographic observation. This shows that the major part of e-Infrastructures users and developers in the sample are distributed in the public sector that also has a higher presence of developers.

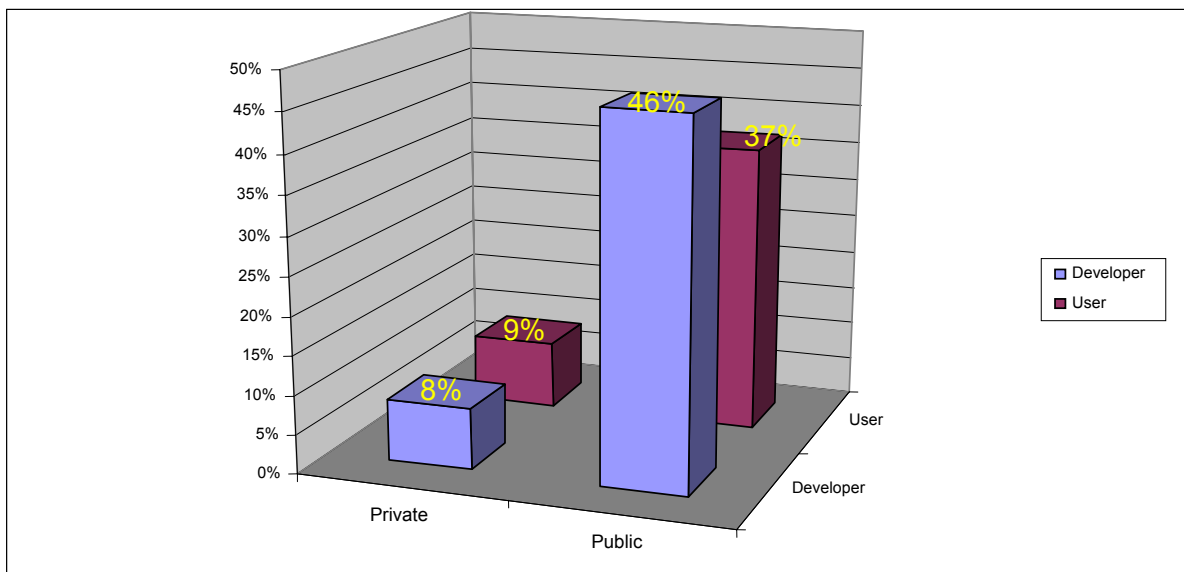


Figure 1 - Type of Organisation / Type of User

The distribution of the panel per scientific area shows that the major e-Infrastructure communities are in the fields of Informatics, Physics, Earth Science and Medicine.

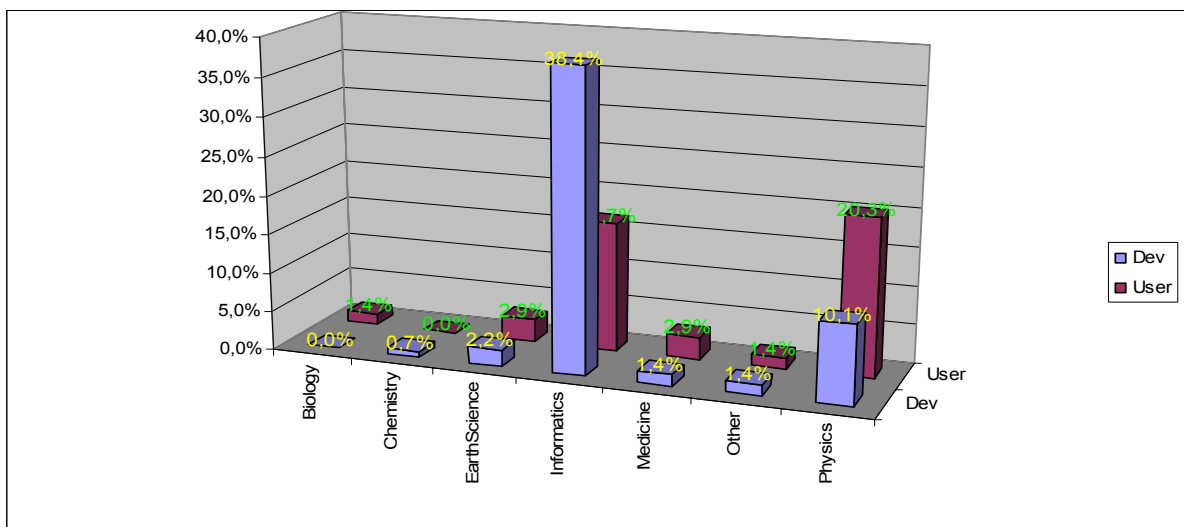


Figure 2 – Discipline / Type of User





The European research mainly takes place in the public sector however it can be noticed a high presence and interest of the private one in terms of applied research.

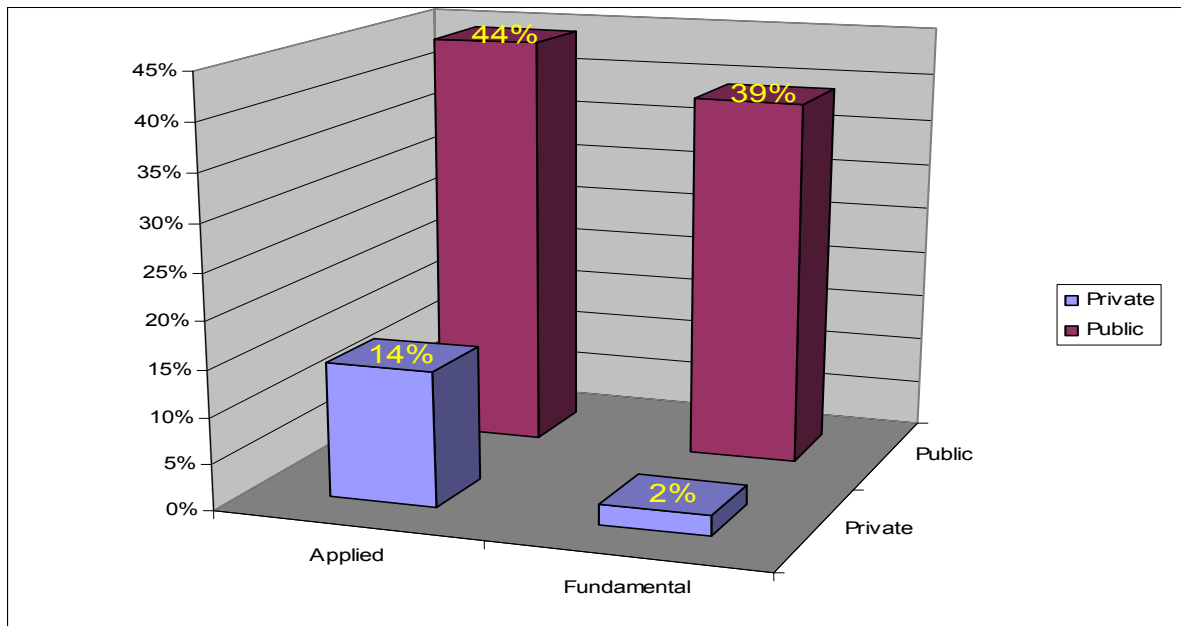


Figure 3 – Type of Research / Type of Organisation

Comparing the types of research (applied vs fundamental) and the scientific areas highlighted by the questionnaire results, an interesting observation (taking into account the four fields highlighted in the previous page, namely Informatics, Physics, Earth Science and Medicine) is that for Informatics, Earth Science and Medicine there is more interest in applied research whereas in Physics the focus is on fundamental research.

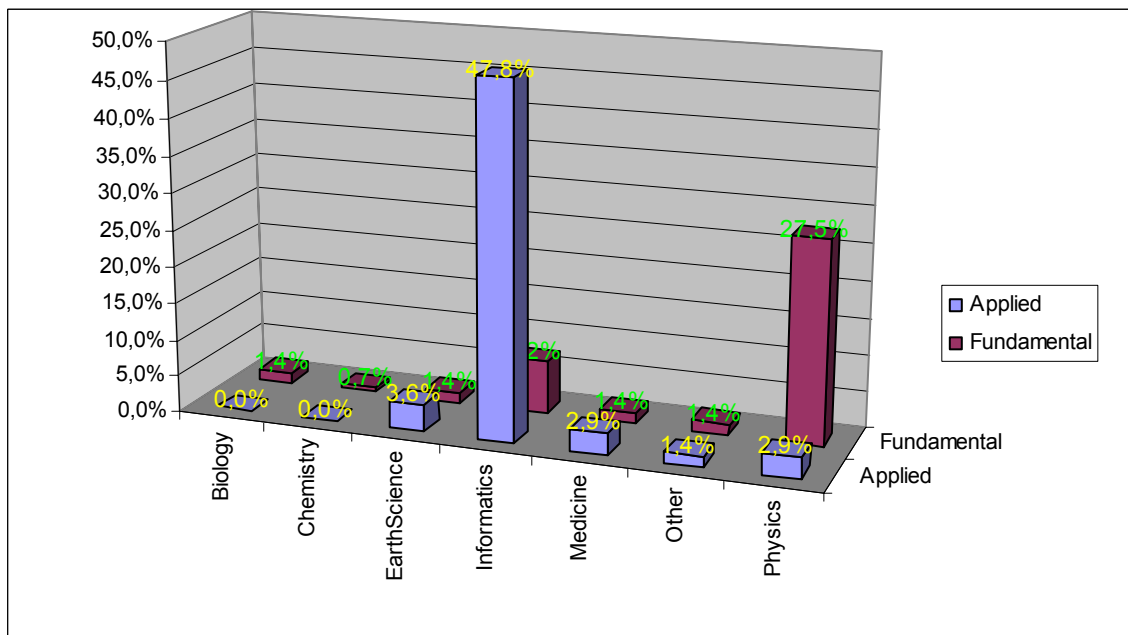


Figure 4 – Discipline / Type of Research



## 4. Conclusions and Actions

The Conclusion session was chaired by Dr. Kyriakos Baxevanidis who summarized the context of the event and derived a number of issues and recommendations from the two days of activities, the most relevant being:

- There are different maturity levels and various needs across communities (data, middleware, networking) but all of them need infrastructure layers to interoperate and cooperate in the standardisation process.
- Joining forces and creating a critical mass among projects can be a way to adequately face a number of challenges concerning standardisation (time and effort needed for adoption, value of standards not always clear, overlapping of competence between bodies, academic vs. commercial interests, etc.).
- Main contribution of e-Infrastructure projects can/should have a significant role both on identification of needs and on validation of standards.
- The testing of standards before their use should be reinforced (in the context of standardisation fora, funded projects etc).
- Projects should identify at an early stage interest, needs, and requirements on standards and disseminate information on work being done, support, training, etc.
- Reinforcement of human networking on standards in the e-Infrastructure area and links with other areas must be furthered as a means to facilitate involvement and adoption (examples: web, mailing-lists, wiki etc).

Actions to be taken at project level were then highlighted:

- Projects were encouraged to establish an easy to locate web-page within the project web site to disseminate relevant information on its standardisation related work, the contact persons, open issues, requirements and needs.
- Each project is also requested to report on follow up actions to this 4th eConcertation Workshop in their next activity reports and reviews.
- Projects are asked to play an active role in identifying their major standardisation needs at an early stage.
- Supporting projects like BELIEF are invited to gather and maintain live documents, information and standard-projects matrices and to create a mailing list on e-Infrastructures standards related topics.
- Projects like OMII-Europe, already heavily involved with standards and providing tailor-made training courses could be contacted to take advantage of these training courses.
- Closer collaboration, exchange of experiences and results achieved among projects is considered beneficial and should be enhanced. The reinforcement of human networking and synergies with other stakeholders should be developed in order to facilitate the production, deployment and use of standards. In this context, an important catalyser role is expected from supporting projects like OGF-EUROPE, GLOBAL, GridTalk and BELIEF-II.





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Further eConcertation meetings will be organised in the near future to foster project exchanges of knowledge.

Tentatively, the envisaged next eConcertation event could be in the same week of OGF23 (June 2-6, 2008) in Barcelona.

The organisers would like to thank, once again, the aforementioned rapporteurs of the parallel tracks for their valuable contribution to the success of the event and wish to continue their highly effective collaboration with them in the future.



## 5. REFERENCES

- [CEN] European Committee for Standardization  
<http://www.cen.eu/>
- [CENELEC] European Committee for Electrotechnical Standardization  
<http://www.cenelec.org/>
- [CORDIS] Community Research & Development Information Service  
<http://cordis.europa.eu/fp7/ict/e-infrastructure/>
- [ETSI] European Telecommunications Standards Institute  
<http://www.etsi.org/>
- [ETSIECONC] European Telecommunications Standards Institute – 4<sup>th</sup> a-Infrastructure Concertation  
<http://www.etsi.org/WebSite/NewsandEvents/ECCconcertation/ECCconcertationDaysHome.aspx>
- [EUSTANDPOL] European Commission, Enterprise & Industry, Policy Areas, Single Market, Standardisation  
[http://ec.europa.eu/enterprise/standards\\_policy/index\\_en.htm](http://ec.europa.eu/enterprise/standards_policy/index_en.htm)
- [ICTSTD] ICT Standardisation  
[http://ec.europa.eu/enterprise/ict/policy/standards/ict\\_index\\_en.htm](http://ec.europa.eu/enterprise/ict/policy/standards/ict_index_en.htm)
- [WIKIP] Wikipedia, The Free Encyclopaedia  
<http://en.wikipedia.org/>



## 6. Appendixes

### 6.1. Workshop Agenda

The workshop was organised as a two-day event and was hosted at ETSI Headquarters in Sophia Antipolis, France. The final agenda was as follows:

#### WEDNESDAY 5 DECEMBER 2007

##### 08:00 - 09:00 Registration & Coffee

- **09:00 - 10:30 WELCOME AND OPENING ADDRESS**

**The consideration of e-Infrastructures in strategic thinking : an integrated vision oriented towards users.**

*Dany Vandromme*, Director, GIP Renater, French representative to ESFRI and eIRG

*Jorgen Friis*, Deputy Director-General, ETSI

**e-Infrastructures fostering the building of Global Virtual Research Communities**  
*Kyriakos Baxevanidis*, Deputy Head of Unit, European Commission

- **10:30 - 11:30 KEYNOTE SPEECHES**

**Chair** : *Kyriakos Baxevanidis*, Deputy Head of Unit, European Commission

**Bridging the gap between Research and Standards**

*Ultan Mulligan*, Strategy and New Initiatives Director, ETSI

*Wolfgang Gentzsch*, D-GRID, Germany

*Steve Crumb*, Executive Director and VP of Operations for the Open Grid Forum

- **11:30 - 12:00 DISCUSSION**

##### 12:00 - 13:30 Lunch sponsored by ETSI

- **13:30 - 16:30 e-INFRASTRUCTURES CONCERTATION PLENARY SESSION**

**Meeting objectives and expected outputs**

**Chair**: *Kyriakos Baxevanidis*, Deputy Head of Unit, European Commission

**FP7/ Call 1 Project presentations** Project Coordinators

**'Scientific Digital Repositories'**:

IMPACT, NMDB, DRIVER II, METAFOR, EuroVO-AIDA, GENESI-DR

**'Deployment of eInfrastructures for Scientific Communities'**:

FEDERICA, EUFORIA, neuGRID, D4Science, EDGeS, ETSF, e-NMR, DORII, SEE-GRID-SCI, EVALSO

**'New Research Infrastructures - Preparatory Phase'**



PRACE

'Design Studies'  
EGI\_DS, DIESIS

**16:30 - 17:00 Coffee Break**

- **17:00 - 18:30 PARALLEL TRACKS**

**DATA TRACK - (Meeting Room IRIS 6)**

**Chair:** *Krystyna Marek*, Project Officer, European Commission

**Rapporteur:** *Wolfram Horstmann*, Bielefeld University

**Projects:** IMPACT, NMDB, DRIVER, DRIVER II, METAFOR, EuroVO-DCA, EuroVO-AIDA, GENESI-DR, D4Science, DILIGENT, DIESIS

**MIDDLEWARE TRACK - (Meeting Room HERMES)**

**Chair:** *Enric Mitjana*, Project Officer, European Commission

**Rapporteur:** *Alistair Dunlop*, University of Southampton

**Projects:** Chemomentum, DEGREE, EC-GIN, GridCC, KnowARC, QosCosGrid, SIMDAT, BalticGrid, BELIEF, BIOINFOGRID, CYCLOPS, DEISA, eDEISA, EELA, EGEE-II, e-IRGSP, ETICS, EUChinaGRID, EU-IndiaGRID, EUMEDGRID, EuroVO-DCA, ICEAGE, int.eu.grid, ISSeG, ITHANET, OMII-Europe, RINGrid, SEE-Grid-2, DIESIS, DORII, EDGeS, EGI\_DS, e-NMR, ETSF, EUFORIA, neuGRID, PRACE, SEE-GRID-SCI

**NETWORKING TRACK - (Meeting Room Iris 2/3)**

**Chair:** *Jean-Luc Dorel*, Project Officer, European Commission

**Rapporteur:** *Martin Potts*, MARTEL

**Projects:** 6DISS, EuroLabs, PHOSPHORUS, AUGERACCESS, EXPRes, GN2, Go4it, SEEREN2, Federica, EVALSO, OCCASION, ORIENT, MUPBED, PORTA OPTICA, SEEFIRE, ALICE, TEIN2, EUMEDCONNECT, WEIRD, LOBSTER

**19:00 Cocktail sponsored by CISCO**

**THURSDAY 6 DECEMBER 2007**

**08:00 -09:00 Registration and Coffee**

- **09:00 - 10:30 PLENARY SESSION**

**Chair:** *Kyriakos Baxevanidis*, Deputy Head of Unit, European Commission

**Report from the Data track**

*Wolfram Horstmann*, Bielefeld University

**Report from the Middleware track**

*Alistair Dunlop*, University of Southampton

**Report from the Networking track**

*Martin Potts*, MARTEL

**Discussion**

**10:30 - 11:00 Coffee Break**



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- **11:00 - 13:00 PLENARY SESSION : ETSI EXPERIENCES**

**Chair:** *Philippe Cousin*, ETSI Services Sales Director

**11:00 - 11:20 : GRID Standardization: GCM and ProActive reference implementation**  
*Denis CAROMEL*, INRIA

**11:20 - 12:00 : The ETSI Experience in supporting Standardisation with methodologies**  
*Dieter HOGREFE*, Chairman ETSI TC-MTS

**12:00 - 12:30 : Achieving interoperability - The ETSI Approach**  
*Anthony WILES*, Director of ETSI Centre for Testing and Interoperability (CTI)

**12:30 - 13:00 : The GO4IT success story**  
*Franck LEGALL* - GO4IT Project Director

**13:00 - 14:00 Lunch sponsored by ERCIM**

- **14:00 - 16:30 PLENARY SESSION AND DEMONSTRATIONS**

**14:00 - 14:30 : GRID: GCM, ProActive and Grid Plugtests**  
*Denis Caromel*, INRIA

**14:30 - 15:00 : IPv6 test bed presentation**  
*Sebastian Müller*, Senior Technical Expert, ETSI Centre for Testing and Interoperability

**15:00 - 15:30 : Test methodology and very quick TTCN-3 tutorial**  
*Peter Kremer*, Senior Technical Expert, ETSI Centre for Testing and Interoperability

**15:30 - 16:00 : Make TTCN-3 happen! Introducing TTworbench as the TTCN-3 environment**  
*Theofanis Vassiliou-Gioles*, Founder and CEO of Testing Technologies.

**16:00 - 16:30 : The GO4IT TTCN-3 Open test platform**  
*Franck Le Gall*, GO4IT Project Director

- **16:30 - 17:00 CONCLUSIONS AND NEXT ACTIONS**

**Chair:** *Kyriakos Baxevanidis*, Deputy Head of Unit, European Commission

**17:00 Closing**



## 6.2. Participants List

Surname	Name	Organisation	Country
Alessandrini	Victor	DEISA	France
Amedro	Brian	INRIA	France
Angori	Enrico G.	ElsagDatamat	Italy
Atanassov	Emanouil	IPP-BAS (SEE-GRID 2 project partner)	Bulgaria
Baxevanidis	Kyriakos	European Commission	Belgium
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Horstmann	Wolfram	DRIVER	Germany
Hughes-Jones	Richard	DANTE	United Kingdom
Hunter	Sarah	EMBL-European Bioinformatics Institute	United Kingdom
Jansen	Wim	CEC	Belgium
Jones	Robert	EGEE project director	Switzerland
Juozapavicius	Algimantas	Vilnius University	Latvia
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Kmunicek	Jan	CESNET	Czech Republic
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Mulligan	Ultan	ETSI Secretariat	France
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Wendelborn	Andrew	University of Adelaide	Australia
Wiles	Anthony	ETSI Secretariat	France
Yun	T. Charles	EXPREs / JIVE	The Netherlands





## 6.3. The Questionnaire

### 1) Demographics

- 1.1 What is your discipline? Physics, Chemistry, Medicine, Biology, Informatics (incl. Networking, Grids...), Earth science, Human sciences, Engineering...
- 1.2 What is your organisation? Private/Public
- 1.3 Type of research? Fundamental, applied
- 1.4 Are you mostly (a) using e-Infrastructure or (b) developing technology for e-Infrastructure?

### 2) For users of e-Infrastructure

- 2.1 How would you evaluate the specificity of your requirements in these areas?
  - Networking: 1-5 (1 is not specific 5 is very specific to my discipline)
  - Grids computing: 1-5
  - Data infrastructure: 1-5
  - Application: 1-5
- 2.2 How do you assess the impact of e-Infrastructure standards in your activity?
  - 1-5 (1- very low 5: very high)
- 2.3 How worth is it making the effort of standardisation?
  - 1 not worth at all 5 very valuable
- 2.4 What are the main benefits?  
Interdisciplinary research/team work/cost reduction/compression of time/reactivity to events/Robustness/accuracy of results/improved knowledge base/other
- 2.5 Will your project deliver technologies, specifications or other outputs that are intended to be European or Worldwide Standards?
- 2.6 Does your project cover specific tasks requiring to interface with standard bodies?

### 3) For developers of e-Infrastructure technology

- 3.1 On which layer do you primarily develop e-Infrastructure technology?
  - Networking, grids, data, application
- 3.2 What is the geographical footprint of the standards you working on?
  - National/European/Continental (excluding Europe)/WW
- 3.3 When developing a standard, to what extent are you in contact with research end-users?
  - 1 (never)-5 (very often)
- 3.4 How worth is it making the effort of standardisation?
  - 1 not worth at all 5 very valuable
- 3.5 What are the main benefits?  
Cost reduction/robustness of code/interoperability/development time/commercial availability/sustainability of code
- 3.6 Will your project deliver technologies, specifications or other outputs that are intended to be European or Worldwide Standards?



*World Class Standards*

3.7 Does your project cover specific tasks requiring to interface with standard bodies?

**4) Standardisation effort**

- 4.1 Open question: in which areas (if any) do you identify the most urgent needs and/or most promising new standard developments?
- 4.2 Open question: for you what is/are the most relevant standardisation body(ies)/forum(s)?
- 4.3 Open question: could you indicate additional aspects that should be addressed to improve projects interfacing with standard bodies?



## 6.4. Standards summary

Project Name	Primary Layer			Standards bodies participation						OGF	OAI	OASIS	W3C	Others	Summary Text
	Net	Mid	Data	DCMI	ETSI	IEEE	IETF	ISO	LOC						
BalticGrid			X							User of Accounting, User account management and SLA specifications					Concerned with testing of gLite middleware
BELIEF															No direct involvement
BIOINFOGRID			X								Workflow management group	Resource description Format (RDF), Xquery, Xlink	Many biology standards. General Feature Format (GFF) standard file format		
Chemomentsum															No Data
CYCLOPS															No Data
DEGREE															No Data
DEISA, eDEISA		X	X							UR-WG, GLUE, BES, JSDL, HPCBP, DAIS, RUS, GIN					Provides active participation to GIN activities, mainly because the Infrastructure projects focuses more on middleware exploitation and interoperation
DIESIS			X										Anticipated involvement in IEEE Simulation standards	This is a new project to simulate critical infrastructure and study dependencies.	



Project Name	Primary Layer			Standards bodies participation						OGF	OAI	OASIS	W3C	Others	Summary Text	
	Net	Mid	Data	DCMI	ETSI	IEEE	IETF	ISO	LOC							
<b>DILIGENT, D4Science</b>			X	Simple Metadata (DCMES) Virtualizing (DC-Collection)					Vocabularies (language, country, dates) Virtual research environments Geographic Metadata & Information and services Archiving/OAIS	Web-Service queries (SRU/WCQL)		Resource exposure/aggregation (OAI-PMH) Object Reuse and Exchange (OAI-ORE)	Web Services (UDDI) A&A (SAML/XACML) Business Markup (ebXML)	[all basics] Web Services (WSDL, SOAP) Ontologies/Semantic Web (e.g. SKOS)	[Ontologies]	
<b>DORII</b>			X								Remote Instrumentation Services in grid environment (RISGE-RG)					
<b>DRIVER, DRIVER-II</b>			X	Simple Metadata (DCMES) Virtualizing (DC-Collection)					Vocabularies (language, country, dates) Virtual research environments Geographic Metadata & Information and services	Web-Service queries (SRU/WCQL)		Resource exposure/aggregation (OAI-PMH) Object Reuse and Exchange (OAI-ORE)	Web Services (UDDI) A&A (SAML/XACML) Business Markup (ebXML)	[all basics] Web Services (WSDL, SOAP) Ontologies/Semantic Web (e.g. SKOS)	[Ontologies]	



Project Name	Primary Layer			Standards bodies participation						OGF	OAI	OASIS	W3C	Others	Summary Text
	Net	Mid	Data	DCMI	ETSI	IEEE	IETF	ISO	LOC						
								Archiving /OAIS							
EC-GIN	X				Grid Specialist Task Force (STF)					Network resource reservation and topology description (GHPN-WG) and Network Markup language (NML-WG)					
EDGeS		X	X							GIN, BES, JSDL, Propose standardisation for service grids					
EELA															No Data
EGEE-II	X	X	X							Security, GIN, Data, Job, Info Systems. DMTF-CIM standard (interaction at OGF)		Consumer as appropriate			
EGL_DS			X												How will standards work with the EGL and National Grids? All grid standards to be



Project Name	Primary Layer			Standards bodies participation							OGF	OAI	OASIS	W3C	Others	Summary Text
	Net	Mid	Data	DCMI	ETSI	IEEE	IETF	ISO	LOC							
																reviewed at a later point.
e-IRGSP																Support for all standards but no direct involvement
e-NMR																No Data
ETICS		X	X					Standardisation of process		Building, Testing and config - WG					Assist with Standards compliance validation + software testing	
ETSF			X											I/O standards required for data, but no standards bodies identified as yet.	European Theoretical Spectroscopy Facility proposes to standardise files	
EUChinaGRID																No Data
EUFORIA										Participation expected in Distributed Resource Management (DRMMA-WG)						Project anticipates involvement in DRMMA-WG and Meta-scheduling activities
EU-IndiaGRID																No Data
EUMEDGRID																No Data



Project Name	Primary Layer			Standards bodies participation							OGF	OAI	OASIS	W3C	Others	Summary Text
	Net	Mid	Data	DCMI	ETSI	IEEE	IETF	ISO	LOC							
EuroVO-AIDA			X	Simple Metadata (DCMES) Virtualizing (DC-Collection)					Vocabularies (language, country, dates) Virtual research environments Geographic Metadata & Information and services Archiving/OAIS	Web-Service queries (SRU/WCQL)		Resource exposure/aggregation (OAI-PMH) Object Reuse and Exchange (OAI-ORE)	Web Services (UDDI) A&A (SAML/XACML) Business Markup (ebXML)	[all basics] Web Services (WSDL, SOAP) Ontologies/Semantic Web (e.g. SKOS)	[Ontologies]	
EuroVO-DCA		X	X								Authentication and Authorization, Astro-RG				Domain standards through IVOA (International Virtual Observatory Alliance)	Can Grid standards be used for the Virtual Observatory? There are many different forms of Astro archives worldwide.
ExPRES	X							TCP enhancement (incl. a transport protocol more suitable to reliable, lowloss transmission media)								



Project Name	Primary Layer			Standards bodies participation						OGF	OAI	OASIS	W3C	Others	Summary Text
	Net	Mid	Data	DCMI	ETSI	IEEE	IETF	ISO	LOC						
FEDERICA	X						Inter-domain exchange of information Control plane and network provisioning for optical networks			Network representation / mark-up language Control plane and network provisioning for optical networks Inter-domain exchange of information				Optical monitoring	
GEANT	X						TCP enhancement (incl. a transport protocol more suitable to reliable, lowloss transmission media)Inter-domain exchange of information			Inter-domain exchange of information					





Project Name	Primary Layer			Standards bodies participation							OGF	OAI	OASIS	W3C	Others	Summary Text
	Net	Mid	Data	DCMI	ETSI	IEEE	IETF	ISO	LOC							
Genesi-DR			X	Simple Metadata (DCMES) Virtualizing (DC-Collection)					Vocabularies (language, country, dates) Virtual research environments Geographic Metadata & Information and services Archiving/OAIS	Web-Service queries (SRU/WCQL)		Resource exposure/aggregation (OAI-PMH) Object Reuse and Exchange (OAI-ORE)	Web Services (UDDI) A&A (SAML/XACML) Business Markup (ebXML)	[all basics] Web Services (WSDL, SOAP) Ontologies/Semantic Web (e.g. SKOS)	[Ontologies]	
ICEAGE		X														Provides GRID Training in many of the OGF Specifications/standards
int.eu.grid		X									Remote Instrumentation Services in grid environment (RISGE-RG)					Also anticipates the need for Grid Visualisation and Steering standards
ISSeG																No Data
ITHANET																No Data
KnowARC		X									BES, JSDL, GLUE, HPCP, GIN, VO's and Security					NorduGRID development transforming ARC to Web Services



Project Name	Primary Layer			Standards bodies participation						OGF	OAI	OASIS	W3C	Others	Summary Text
	Net	Mid	Data	DCMI	ETSI	IEEE	IETF	ISO	LOC						
<b>METAFOR</b>			X	Simple Metadata (DCMES) Virtualizing (DC-Collection)				Vocabularies (language, country, dates) Virtual research environments Geographic Metadata & Information and services Archiving/OAIS	Web-Service queries (SRU/WCQL)		Resource exposure/aggregation (OAI-PMH) Object Reuse and Exchange (OAI-ORE)	Web Services (UDDI) A&A (SAML/XACML) Business Markup (ebXML)	[all basics] Web Services (WSDL, SOAP) Ontologies/Semantic Web (e.g. SKOS)	[Ontologies]	
<b>neuGRID</b>		X	X							DAIS, but other needs in Workflow, Visualisation, AuthN, AuthZ. Enterprise grid working group				SRM interaction with DIACOM	
<b>NMDB</b>			X	Simple Metadata (DCMES) Virtualizing (DC-Collection)				Vocabularies (language, country, dates) Virtual research environments Geographic Metadata &	Web-Service queries (SRU/WCQL)		Resource exposure/aggregation (OAI-PMH) Object Reuse and Exchange (OAI-ORE)	Web Services (UDDI) A&A (SAML/XACML) Business Markup (ebXML)	[all basics] Web Services (WSDL, SOAP) Ontologies/Semantic Web (e.g. SKOS)	[Ontologies]	



Project Name	Primary Layer			Standards bodies participation							OGF	OAI	OASIS	W3C	Others	Summary Text
	Net	Mid	Data	DCMI	ETSI	IEEE	IETF	ISO	LOC							
								Information and services Archiving /OAIS								
<b>OMII-Europe</b>		X								Security (AuthZ - VOMS), Data (DAIS), Jobs (BES, JSDL), Accounting (UR, RUS), Information Model (GLUE), GIN Secretary		SAML, XACML (Spec consumers - not involved in definition)				Significant involvement in the definition and implementation of many OGF specifications
<b>Phosphorus</b>	X						Inter-domain exchange of informationControl plane and network provisioning for optical networks			Network representation / mark-up languageControl plane and network provisioning for optical networksInter-domain exchange of information					Optical monitoring	
<b>PRACE</b>		X								Interested in participating in AAA, monitoring, security, Data, Resource						New project and involvement is yet to start but specific standards groups have ben identified



Project Name	Primary Layer			Standards bodies participation						OGF	OAI	OASIS	W3C	Others	Summary Text
	Net	Mid	Data	DCMI	ETSI	IEEE	IETF	ISO	LOC						
										Management					
QosCosGrid															No Data
RINGrid			X												Anticipates involvement in RISGE-RG or equivalent
SEE-Grid-2		X	X												
SEE-GRID-SCI			X							Security					
SIMDAT		X	X									WSRF Consumer	WMO (World Meteorological Organisation) involvement in GTS (Global Telecommunication System)	Large numbers of GRIA grid middleware (WSRF based) users. OGSA-DAI concern - No Standards for rules	