



Grant agreement no. 211714

neuGRID

A GRID-BASED e-INFRASTRUCTURE FOR DATA ARCHIVING/COMMUNICATION AND COMPUTATIONALLY INTENSIVE APPLICATIONS IN THE MEDICAL SCIENCES

Combination of Collaborative projects & Coordination and support actions

Objective INFRA-2007-1.2.2 - Deployment of e-Infrastructures for scientific communities

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PU	Public	PU
PP	Restricted to other programme participants (including the Commission Services)	
RE	Restricted to a group specified by the consortium (including the Commission	
CO	Confidential, only for members of the consortium (including the Commission Services)	

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Executive summary

Deliverable 4.5 Dissemination report III outlines the dissemination activities which have been performed by the neuGRID consortium between the beginning of the project and January 2010 (month 36). It is part of Workpackage 4 *Dissemination, exploitation, concertation and training*, specifically devoted to define a focused dissemination strategy capable to enhance exploitation.

For this purpose, a *Dissemination and training plan (D4.1)* was produced by the Consortium in October 2008, identifying the communication objectives, activities and tools for dissemination, training and distributing the work among project partners, scientific community, industrial community as well as lay media. Based on the agreed dissemination plan, the consortium partners have performed several dissemination activities, as detailed below. These activities have reached more than 15,000 professionals.

1. Introduction

Dissemination is considered as a key factor to the success of a project. It consists on an ongoing activity which aims at increasing project awareness both in the scientific community and also in the other target user groups which can gain benefits from the results of neuGRID research. For this reason, the most appropriate channels to disseminate project results have been chosen and used by the Consortium to present the research work and to inform those active parties both during and after the project end.

All along the duration of the project, the partners disseminated the results in different ways, according to their role in the field of research and development. Internal and external dissemination activities have been performed.

Past and future dissemination activities have been summarised in the form of a table maintained by the Coordinator as shown in Table n.1 *Dissemination activities*.

Dissemination activities have been coordinated by CO1 FBF Provincia Lombardo-Veneta - Ordine ospedaliero di San Giovanni di Dio Fatebenefratelli, as leader of Workpackage 4, with the contribution of partners involved according to the work description. Contributions by the partners have been adequate to their competencies and field of expertise.

2. Methodological approach

The neuGRID project is focused on setting up "a grid-based e-infrastructure for data archiving/communication and computationally intensive applications in the medical sciences".

The exploitation of the developed infrastructure for the exchange of imaging and clinical data has been assured by a focused dissemination strategy, ensuring effective collaboration both within the project and with communities external to it, and coordinating neuGRID with related projects and activities carried out in Europe and elsewhere. The dissemination strategy has as its main objectives:

- To disseminate project results to the relevant scientific communities;
- To raise awareness at the political and decision-making levels of the opportunities offered by neuGRID;
- To spread within research-, academic- and clinical communities knowledge about the facilities and tools supplied by the infrastructure;
- To assess the regulatory needs of the pharmaceutical industry for pre-competitive research and clinical trials including clinical trial registration, agreements that should be prepared and signed by potential industry users, IPR management, and regulations for data ownership, exchange, and analysis; to define the adaptations or expansions of the present infrastructure to host industry pre-competitive research and randomized clinical trials with clinical and imaging/biological surrogates; and to define a set of activities that should be carried out to

- make neuGRID compliant with industry needs;
- To promote compatibility of neuGRID with related initiatives that are being carried out in North America, Japan, and Australia;
- To promote integration into neuGRID of the most popular tools for brain image analyses to carry out high performance grid computing by international researchers on own or merged datasets;
- To spread infrastructure aims and services to be exploited in the daily research and clinical practice;
- To teach potential users how to use the implemented services through the provided GUI;
- To teach research users how to take advantage by the high performance computing facilities.

There are several possible channels for disseminating information and results about neuGRID. The selection of modalities and ways varies in relation to the communication targets.

As detailed in the *Dissemination and training plan*, during all the 36 months of the project the dissemination activities have included: conferences, teleconferences, meetings, workshops, letters of intent, emails, articles, poster, video and the creation of the project logo and project website in order to reach the largest number of professionals and lay audience.

These have been identified to be powerful tools to outline the project aims and to enhance public awareness of the neuGRID efforts in Europe.

Particular attention has been devoted to the specific characteristics of the various players and target groups identified to be the main beneficiaries of the dissemination: the activities have been targeted and customized in order to fit with their profile, demands and expectations.

3. Training

As a result of internal discussion, it has been felt appropriate and agreed to initiate a series of trainings primarily destined to advanced neuGRID users. As defined in D9.1 "User Requirements Specification", paragraph "The Actors in neuGRID":

"This group of users wants full control over their work environment. They may wish to construct new tools or adapt existing ones for other purposes. It is likely that such users have a high degree of experience and probably a good understanding of computing techniques. The flexibility to do what they want is paramount to this group of users and they do not wish to be constrained in their work by the system. They may also perform tasks that are covered by the Basic and Intermediate user roles from time to time".

Advanced users trainings will therefore include the following contents:

- 1) how to access the neuGRID platform
 - a. what is neuGRID's system security and overall architecture
 - i. what is and how works the grid (from the big picture to individual components)
 - b. how to obtain an electronic identity (i.e. x509 certificate)
 - c. "dos" and "don'ts" with x509 (and PKI security infrastructures in general)
- 2) how to interact with the grid, using the provided command line interfaces (i.e. CLI)
 - a) how to talk to the file catalogue and storage elements
 - b) how to submit, monitor and retrieve outputs of grid jobs from scheduler and computing elements
 - c) how to query the grid information system
- 3) how to run jobs in the grid (from simple to more complex ones)
 - a. how to write a job description in JDL
 - b. how to specify parametric and DAG jobs

- c. how to use the provided Desktop Fusion and/or GSISSE facilities to interact with the grid
 - i. how to post-process jobs' outputs
 - ii. how to visualise jobs' outputs
 - iii. how to handle data, from simple replica creation to download, move, removal and sharing

Training to advanced users has been done both remotely, by providing online support during the utilization of the grid environment, as well as by means of dedicated meetings (co-located with quarterly in-person meetings) where member of the Developer Teams (P2 Prodema, P3 UWE, P4 MAAT and P7 HealthGrid) met with Advanced neuGRID Users from the User Team (CO1 FBF, P5 Vumc and P6 KI) and provided monitoring and support during daily simulation/experiments.

The results of the training sessions have been evaluated by providing an exercise/hands-on to the trainees and/or by mean of online questionnaires. Through the completion of the exercise, their results and feedback on the use of the neuGRID's infrastructure was gathered.

The first training session was held in Stockholm, on 8^h June 2010. A total of 10 users participated to the session.

The second training session was held in Brescia on 7th September 2010. A total of 9 users participated to the session.

The third training session was held in Geneva on 6th December 2010. A total of 5 users participated to the session.

The fourth and last training session was held in Brussels on 25th January 2011. A total of 4 internal users participated to the session. Notably, to this session 2 external users took part to the training session.

4. The neuGRID Advisory Board

One of the critical nodes where dissemination took place was the project **Advisory Board (AB)**, which is composed of representative people from the institutions and communities, with an immediate or prospective interest in the deployed e-infrastructure as its potential users. In accordance with the Technical Annex of the Project, the AB has been set up within the first months of the project. AB members (Neuroscientists, Computer Scientist, and representative of European and international projects on Alzheimer's disease) have been identified per their expertise and have been asked to contribute to specific activities of the project, among which:

- Promote links of neuGRID with worldwide ADNI related initiatives
- Advise on compatibility issues and potential integration of other (similar) platforms, advice on gridification models, support in formulating new requirements for submission to the EGEE gLite (grid middleware) community
- Advise on neuGRID's features of potential interest to pharma
- Help with political liaisons at the European level and links with neuroscientific communities
- Take part to user requirements session
- Provide feedback about the performance of neuGRID.

Involvement of the Advisory Board has proven to be a pivotal factor in the dissemination process: endorsement of neuGRID by key persons of institutional bodies and agencies can have a high impact, as they can promote the adoption of and exploitation of neuGRID by new research project

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and biotech companies. Moreover, representatives of scientific societies can help find time and space for training courses or promote links with scientists working in related fields.

Two main groups of immediate users, represented in the AB, were envisaged for neuGRID: neuroscientists and developers of algorithms for the analyses of brain images.

During the first year of the project, the Advisory Board has been established as described in the table below. Twenty members, from different European and American organisations, agreed to be part of the AB. All AB members signed a non-disclosure agreement prior to having access to full information about the project.

On January 25th 2010, the second Conference call involving members of the Advisory Board was organised. The Advisory Board has been presented with an extensive outline of the project achievements and results of the first year, together with a brief description of future planned events and activities.

The neuGRID Advisory Board's composition is showed in the following table

neuGRID Advisory Board

	Group	Name	Role	Affiliation	Proposed Tasks
1	Political liaisons	Roberto Amendolia	<i>P.I. of Mammogrid and Scientific Attaché, Italian Embassy in London</i>	Scientific Attaché, Embassy of Italy in the U.K.	Help with political liaisons at the European level and links with neuroscientific communities
2	Computer scientists	John Ashburner	<i>Statistical Parametric Mapping developer</i>	Functional Imaging Laboratory, Wellcome Department of Imaging Neuroscience, University College London, London, UK	Explore the possibility of integrate SPM into neuGRID
3	Related project in Europe/U.S.	Maria Carrillo, Ph.D.	<i>Alzheimer's Association director, medical and scientific affairs</i>	Alzheimer's Association Director, Medical and Scientific Relations Chicago, Illinois	Promote links of neuGRID with worldwide ADNI related initiatives
4	Related projects in Europe	Bruno Dubois	<i>Principal Investigator of IFRAD (French ADNI)</i>	Professor of Neurology, Salpêtrière Hospital, Paris Director, Behavioural Unit, Salpêtrière University Hospital, Paris Director of Research Unit INSERM U610, Salpêtrière Hospital, Paris	Contribute data from the French ADNI into neuGRID
5	Computer scientists	Alan Evans	<i>Director of the Montreal Consortium for Brain Imaging Research (MCBIR)</i>	Director of the Montreal Consortium for Brain Imaging Research (MCBIR), Montreal Neurological Institute (MNI) at McGill University in Montreal	Provide consultancy on gridification and use of the cortical extraction pipeline into neuGRID
6	Prospective user group	Massimo Filippi, MD	<i>Neuroscientist in fields other than Alzheimer's ENS Subcommittee on Neuroimaging</i>	Director Neuroimaging Research Unit, Scientific Institute and University San Raffaele, Milan Italy; John Whitaker Professor of the American Neurological Association Adjunct Professor, Department of Neurosurgery, School of Medicine, Temple University, Philadelphia, USA Visiting Professor, School of Medicine, University of Belgrade, Serbia	Take part to user requirements session - provide feedback about the performance of neuGRID when in place
7	Computer scientists	Anthony Gamst, PhD	<i>Computer scientist</i>	Associate Professor (Statistics) Neurosciences and Biostatistics and Bioinformatics University of California, San Diego Director of Clinical Informatics, ADNI	Advice before and during the development of compatibility between LORIS and the LONI databasing system (according to AZ's judgement)
8	Related projects in Europe	John Geddes, MD	<i>Principal Investigator of NeuroGrid</i>	Professor of Epidemiological Psychiatry, Director, Oxford Clinical Trial Unit for Mental Illness (a registered UKCRC CTU); Director, Centre for Evidence-Based Mental Health Department of Psychiatry University of Oxford	Advice about architecture on specific occasions (according to TS's judgement) NeuroGrid feedback on past (similar) experiences,
9	Related projects in Europe	Hans-Goran Hardemark	<i>Co-leader of Pharmacog WP5</i>	PI for Astra Zeneca in the IMI project PharmaCog/European ADNI	Liason with the largest ADNI effort in Europe.
10	Related project in Europe	Simon Lovestone, PhD, MRCPsych	<i>outGRID co-PI</i>	Professor of Old Age Psychiatry, NIHR Biomedical Research Centre for Mental Health MRC Centre for Neurodegeneration Research Departments of Psychological Medicine and Neuroscience, King's College London, Institute of Psychiatry	Help to integrate the AddNeuroMed dataset into neuGRID
11	Supervisor of Legal and Ethical aspects	Roberto Lattanzi	<i>Doctor</i>	Italian Data Protection Authority, Rome, Italy	supervisor of legal and ethical aspects of the neuGRID activities

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12	Related projects in Europe	Johan Montagnat	<i>NeuroLOG co-PI</i>	French National Center for Scientific Research (CNRS) Laboratoire d'Informatique Signaux et Systèmes de Sophia-Antipolis (I3S)	Advice on compatibility issues and potential integration of other (similar) platforms, advice on gridification models, support in formulating new requirements for submission to the EGEE gLite (grid middleware) community,
13	Related projects in Europe	Wiro Niessen	<i>Leader of the Data Management Workpackage of the EuroBioImaging Initiative</i>	Erasmus MC / Tu Delft	Liason with the most pertinent ESFRI initiative
14	Pharmaceutical Company	Susanne Ostrowizki	<i>Partner of Pahrmacog WP5</i>	PI for Roche in the IMI project PharmaCog/European ADNI	Liason with the largest ADNI effort in Europe.
15	Neuroscientists in the Alzheimer's field	Philip Scheltens	<i>Chairman of the Dementia Study group of the European Federation of Neurological Society</i>	Dept. Neurology/Alzheimer Center VU University Medical Center	Help organize training courses to EFNS neuroscientists
16	Computer scientists	Stephen Smith	<i>Director of FMRIB, Oxford, UK</i>	Professor of Biomedical Engineering Associate Director, Oxford University FMRIB Centre	Advise on the usefulness of the infrastructure for algorithm developers.
17	Computer scientists	Paul Thompson	<i>Developer of Cortical Pattern Mapping and Radial Mapping</i>	Professor of Neurology UCLA School of Medicine, Los Angeles	Explore the possibility of integrate cortical pattern and radial mapping into neuGRID
18	Neuroscientists in the Alzheimer's field	Bruno Vellas	<i>Principal Investigator of EADC</i>	University Professor, Hospital Practitioner, dept. of Geriatric Medicine, Univ. Hosp. Center, Toulouse, Purpan Faculty of Medicine, University Paul Sabatier, Toulouse, France. Research Associate Professor, Clinical Nutrition Laboratory (Aging Process Study), School of Medicine, University of New Mexico, USA.	Help organize training courses to EADC neuroscientists
19	Neuroscientists in the Alzheimer's field	Gunhild Waldemar	<i>Chairman of the European Federation of Neurological Societies (EFNS), Scientific Panel on Dementia</i>	European Federation of Neurological Societies representatives (EFNS) Professor of Clinical Neurology (dementia research), University of Copenhagen	Help organize training courses to EFNS neuroscientists
20	Neuroscientists in the Alzheimer's field	Bengt Winblad	<i>Co-Principal Investigator of the EADC</i>	Professor of geriatric medicine and chief physician at the Karolinska University Hospital, Huddinge and the Karolinska Institutet in Stockholm, Director of the Karolinska Institutet Aging Research Center (ARC), KASPAC (Karolinska Institutet Sumitomo Pharmaceutical Alzheimer Center) and the Swedish Brain Power Center of Excellence	Help organize training courses to EADC neuroscientists

5. Activities performed

Several scientific national and international conferences and congresses took place in the three years of the neuGRID project. The neuGRID project was well acknowledged during these events, thanks to the participation of several project investigators as part of the Scientific Committees or as speakers.

The neuGRID team has been proactively engaged in activities aimed to spread awareness of the Consortium research and present the early results of the research in the context of scientific meetings. Dissemination activities have consisted of materials (posters, papers, leaflets) which have been distributed during the project meetings and input into the private part of the neuGRID website and in publications that have appeared in scientific journals.

The table in Annex 1 provides an overview of the dissemination activities already performed by the Consortium at the time of submission of the present deliverable and a list of the planned ones.

In general, dissemination events and activities, organised by or to which the neuGRID team has taken part, can be divided into the following categories:

- Technical/Grid-related event
- Neuroscientific events
- Political events and activities.

A selection of the most relevant dissemination activities made up to the end of the second year of the project is reported below, divided in the aforementioned categories. In view of their relevance, for each of them a short summary is given.

Technical/Grid-related events

Healthgrid 2008

The international HealthGrid 2008 Conference (Chicago, June 2nd-4th 2008) can be considered as one of the major events of this first year, for the size of audience who attended the meeting (about 200 people) and the number of countries to which the conference was addressed (Europe, USA, and Asia-Pacific). This event was identified as a good opportunity to compare international experiences in the field of user requirements, data integration and archiving in healthgrids; to trigger discussions in Europe and in the US toward the convergence and identification of sustainable means to crystallize research results and to improve their successful adoption in industry; and to foster the creation of technological bridges by establishing cross-continent cooperation, ultimately resulting in bilateral innovation exchanges.

The following topics were identified: 1) Identifying ways forward for the convergence towards a community healthgrid platform and infrastructure. 2) Security and privacy in healthgrids, Common practices in international projects. Emergence of a healthgrid global regulation. 3) Medical data integration and exploitation in grids. 4) European and American Technologies and their Integration/gridification.

During this event, more than 100 project leaflets about neuGRID programme and objectives were distributed to the participants. Yannick Legré and Tony Solomonides from P7 HEALTHGRID were in charge of the organisation of the Conference.

Also P4 MAAT took an important role in this event, by organising the "Building Bridges in Healthgrids" workshop. During this event, it networked neuGRID with other major initiatives in the community such as the European FP6 funded Health-e-Child project and the NIH funded Cancer Biomedical Informatics Grid (caBIG) project in the US. It also introduced the project attending technical members to Pr. Ian Foster and team from Argonne National Laboratory (ANL), Children's Oncology Grid (COG) project and Dr. Ilias Iakovidis, Deputy Head of ICT for Health Unit at the European Commission, who was invited to give the opening speech.

EGEE'08

Another major dissemination event was the Enabling Grids for E-Science conference (EGEE08),

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which took place in Turkey from September 22nd to September 26th 2008. About 550 participants coming from all over the world attended this meeting. The audience included computer scientists, grid experts and algorithm developers. neuGRID was present. In view of this event, a demonstration of neuGRID's technical achievements was developed by P4 MAAT.

EGEE'09

In March 2009, CO1 FBF together with P4 MAAT and P7 HealthGrid participated to the EGEE/OGF25 event in Catania, Italy. Among other activities, a talk entitled "LORIS IN neuGRID: AN EFFICIENT DATABASE MANAGEMENT SYSTEM FOR DATA HANDLING IN THE NEUROIMAGING COMMUNITY" has been given.

In September 2009, a neuGRID representative team (P4 MAAT and P7 HealthGrid) took part to the EGEE '09 conference in Barcelona (Spain), a conference dragging every year more than 300 people specialised in GRID computing applied to various fields. For the occasion, neuGRID entered the competition for the Best Demonstration, by submitting a demonstration video (screen capture of the demo and voiceover) to the congress organisers, eventually having it published online (YouTube). There were about 20 project demonstrations in the competition. NeuGRID won the Best Live Demonstration award. The video is available on <http://gridtalk-project.blogspot.com/2009/09/best-poster-and-best-demo-competition.html> and on <http://www.youtube.com/watch?v=fpfD6GZ90tQ>. Up to now, the neuGRID Demo has been watched more than 700 times.

Link to the demonstration have been circulated among the AB members and feedbacks received have been overall positive.

All Hands Meeting 2008

The All Hands Meeting (AHM 2008) which was held in Edinburgh on September, 8th-11th 2008, too, was an opportunity to shown to an audience manly composed by Scientists, Engineers and students neuGRID prototypes and service design ideas (P3 UWE).

P3 UWE also prepared and submitted an abstract to The All Hands Meeting 2009 to be held in Oxford.

MICCAI

In September 2009 P4 MAAT and CO1 FBF jointly organised the MICCAI-GRID, Medical Imaging on Grids, HPC and GPU-based Technologies (held in London, 24th September 2009) within the framework of the MICCAI initiative (Medical Image Computing and Computer Assisted Intervention). The organisation of the event included: coordination of invitations for MICCAI Program Committee, Draft Call For Paper document, communication to the Program Committee members regarding the review process, coordination of the paper review, organisation of PC teleconference to finalise the review process, communication to authors of the final results, communication with the MICCAI organisers regarding the logistic of the event.

To the Program Committee participated also members from P2 PIT and P3 UWE. Authors of selected papers were invited to present their work and to participate to the Open Round Table at the end of the day. Chairman of the Round Table was Prof. S. R. Amendolia, member of the Advisory Board.

GRISU

In the framework of T4.3 Concertation activity, contacts with the GRISU' initiative (GRId Sud – grid infrastructure for the South of Italy) have been started to evaluated a possible collaboration between the two initiatives. Talks are still ongoing.

Neuroscientific events

ADNI

Regular contact with the ADNI (Alzheimer's Disease Neuroimaging Initiative) consortia have been assured by CO1 FBF, to update international Alzheimer's neuroscientists on neuGRID's progress, collect information and discuss about strategic sustainability of neuGRID within the Alzheimer's imaging community.

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Dr. Frisoni (CO1 FBF) mentioned the objectives of the neuGRID project during the ADNI Spring Steering Committee Meeting which was held in Chicago on April 14th, 2008, and participated to the monthly worldwide ADNI teleconferences.

Presentations focusing on the nature and programme of neuGRID have been made by CO1 FBF during the EADC annual meeting (Thessaloniki, April, 27th-29th 2008). Updates of own and related activities world wide have been disseminated among consortium partners.

CO1 FBF also took part in the neurological meetings of the American Association of Neurology to collect information about non-ADNI projects on non-Alzheimer diseases in the neuroscience field in North America and elsewhere.

In April 2009, a selection of neuGRID's standard dissemination material (slide set) has been provided to M. Carrillo, member of the neuGRID Advisory Board, for her to present it during the annual update on ADNI related initiatives.

Political events/activities

LoNI/UCLA

During the first year, negotiations have been engaged with the infrastructure hosting the so far largest image repository of medical images for the study of Alzheimer's disease (LoNI at UCLA). It was agreed that the GUI of the "LoNI Pipeline" would be integrated into neuGRID as a workflow editor which will provide some level of compatibility between these initiatives.

BELIEF II

From the beginning of 2009, the neuGRID Consortium has collaborated with the BELIEF Digital Library, by sending project's dissemination material, public deliverables and other material related to the project.

European Commission

A selection of dissemination slides was sent to J. Bacquet (VPH delegate at the European Commission) to present during the HealthGrid meeting, held in Berlin, June 2009.

neuGRID Final Event

Thanks to the support of the Member of the European Parliament Mario Mauro, the neuGRID consortium, jointly with the outGRID project (EU funded project n°246690), has organised a high-level seminar hosted at the European Parliament on January 26th 2011.

A renowned communication company, Hill & Knowlton has taken care of the event communication, in close cooperation with the Coordinator, with the office of the MEP and with CFC.

The aim of the meeting was to discuss how e-Science can help fight pressing societal problems such as Alzheimer's Disease.

Speakers included the Director General of DG INFSO Mr. Robert Madelin, Directorate F Director Mr. Mario Campolargo, Mr Remi Quirion from the Canadian Institute of Health Research, scientific and technical partners of neuGRID and outGRID, officers from DG RESEARCH Joint Programming for Neurodegenerative Diseases and DG SANCO. Speakers discussed the state-of-art and the future needs of e-Infrastructures at the crossroads of research, information and communication technology, and clinical care. Special emphasis was devoted to the international context where e-Infrastructures need to be built and become operational. The feasibility of the ultimate goal of neuroscientists to develop a global virtual imaging laboratory by joining forces across the Atlantic was addressed. A roundtable on Better Brain Health Through Innovative Technology has been moderated by a professional journalist.

The event, its objectives and its results, have been summarized in a final report enclosed in Annex 3

The agenda is reported below:

WELCOME	Mario Mauro , Member of the European Parliament
OPENING	e-Science and the Brain - Towards the European Year of Active Ageing and the European Year of the Brain Robert Madelin , Director General INFSO Introduction by Mario Campolargo , Director, Emerging Technologies and Infrastructures, DG INFSO
THE PROBLEM	e-Infrastructures to Foster Drug Discovery for Alzheimer's and Neurodegenerative Diseases Giovanni B. Frisoni , Coordinator of neuGRID and outGRID
THE EUROPEAN SOLUTION	neuGRID Richard McClatchey , Technical Supervisor of neuGRID
THE NORTH AMERICAN SOLUTION	CBRAIN and LONI Alan Evans , Principal Investigator of CBRAIN, Montreal, Canada
THE GLOBAL SOLUTION OF THE FUTURE	outGRID: integrating neuGRID with LONI and CBRAIN to develop an e-Science global electronic infrastructure David Manset , Technical Coordinator of outGRID
INTERNATIONAL ROUND TABLE	Better Brain Health Through Innovative Technology In Europe And North America - Moderator: Gary Finnegan Rémi Quirion , Canadian Institute of Health Research Kostas Glinos , Head, Unit GEANT & e-Infrastructures, DG INFSO Peteris Zilgalvis TBC , Head of Unit, ICT for Health, DG INFSO Philippe Cupers , Joint Programming for Neurodegenerative Diseases Karin Lohmann , WP Chair Process Plan in Euro-Biomedicine
CONCLUSIONS	Mario Mauro , Member of the European Parliament
COCKTAIL	All participants are invited

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A total of 60 people, attended the meeting, representing different stakeholders in addition to neuGRID partners, as listed below:

Carlos	Aguilar	Karolinska Institutet
Carmela	Asero	DG-INFSO Directorate F: Emerging Technologies and Infrastructures F.3: GEANT and eInfrastructures
Chiara	Barattieri di San Pietro	IRCCS San Giovanni di Dio Fatebenefratelli
Frederik	Barkhof	VU medical centre
Roel	Beelen	Department of cardiovascular and thoracic surgery OLV Hospital Moorselbaan
Giuliano	Binetti	IRCCS San Giovanni di Dio Fatebenefratelli
Peter Charles	Bloodsworth	University of the West of England
Elisabetta	Brunello	IRCCS San Giovanni di Dio Fatebenefratelli
Mario	Campolargo	DG INFSO - the Directorate General for Information Society and Media. Directorate F: Emerging Technologies and Infrastructures
Stefano Francesco	Cappa	Vita-Salute San Raffaele University, Milano (Italy)
Keith Sean	Cover	VU medical centre
Philippe	Cupers	DG-RESEARCH
Giovanni	De Girolamo	IRCCS San Giovanni di Dio Fatebenefratelli
Alan Charles	Evans	Montreal Consortium for Brain Imaging Research (MCBIR)/ McGill University
Franco	Fabello	IRCCS San Giovanni di Dio Fatebenefratelli

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Bernhard	Fabianek	DG-INFSO Directorate F: Emerging Technologies and Infrastructures F.3: GEANT and eInfrastructures
Jean-Eammuel	Faure	DG-RESEARCH Research Infrastructures (Unit B3)
Gary	Finnegan	Moderator
Carla	Finocchiaro	CF consulting
Giovanni	Frisoni	IRCCS San Giovanni di Dio Fatebenefratelli
Lutz Paul Gunter	Froelich	Central Institute of Mental Health Medical Faculty Mannheim, University of Heidelberg
Daniela	Galimberti	Head of the Behavioural and Cognitive Neurology & Dementia section of the European Neurological Society
Nick	Gazulis	United States Mission to the European Union
Roberta	Ghidoni	IRCCS San Giovanni di Dio Fatebenefratelli
Kostas	Glinos	DG-INFSO Directorate F: Emerging Technologies and Infrastructures F.3: GEANT and eInfrastructures
Niobe	Haitas	Healthgrid
Carl Johan	Hjertqvist	President, Health Consumer Powerhouse in Brussels
Ralf	Ihl	Alexianer Krefeld GmbH, Maria-Hilf-Krankenhaus, Klinik für Gerontopsychiatrie und -psychotherapie
Sharon Belle Irwin	Irwin	Mission of Canada to the European Union
Christine-Lise	Julou	Director - Scientific, Technical & Regulatory Affairs

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Clemens	Knezu	Project Officer - INFOS (European Commission)
Roberto	Lattanzi	Italian Data Protection Authority, Rome, Italy
Davide	Lecchini	Permanent Representation of Italy to the European Union
Yannick Alain	Legré	Healthgrid
Gordon	Lennox	DG: Information Society and Media
Laura	Leone	GARR - The Italian Academic and Research Network
Karin	Lohmann	EuroBioImaging
Robert	Madelin	DG INFOS - the Directorate General for Information Society and Media.
Jean-Francois Louis Robert	Mangin	Neurospin
David	Manset	Maatg
Ann Marie	Martin	Principal Scientific Manager Knowledge Management Innovative Medicines Initiative
Gianlorenzo	Martini	Lombardia Region Delegation
Mario	Mauro	Group of the European People's Party (Christian Democrats)
Richard	McClatchey	University of the West of England
Jean-Marie	Misztela	DG-DIGIT, Directorate B: Information Systems and Interoperability Solutions, Unit B.4: Information Systems for Policy Support, Grant Management, e-Procurement, Sector 007: Planning, Governance and Support for Grant Management Systems

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Eva Mathilda	Örndahl	Karolinska Institutet
Grazia	Pagano	CF consulting
Corinna	Porteri	IRCCS San Giovanni di Dio Fatebenefratelli
Remi	Quirion	International Collaborative Research Strategy for Alzheimer's Disease/ Mc Gill University
Alberto	Redolfi	IRCCS San Giovanni di Dio Fatebenefratelli
Emilia	Romano	Committee on the Environment, Public Health and Food Safety
Ronaldus Antonius	Schnijdel	VU medical centre
Daria	Serani	Assistant to Ms. Patrizia Toia MEP
Christian	Spenger	Prodema Medical
Gabriela	Spulber	PHD Student - Karolinska Institutet
Maddalena	Vario	Consortium GARR
Elisabetta	Vaudano	Principal Scientific Manager Innovative Medicines Initiative
Lars-Olof	Wahlund	Karolinska Institutet
Peteris	Zilgalvis	DG-INFOS Directorate H: ICT addressing Societal Challenges H.1: ICT for Health

6. Dissemination materials

Website

One of the first achievements of neuGRID was the establishment by the coordinating unit, CO1 FBF, of a website (www.neugrid.eu), with both a public- as well as a private (confidential) section. The public part, with open access from the home page through specific tool buttons, so far includes an overview of the project, the list of partners with contact information, the composition of the Advisory Board, the list of the projects related to neuGRID and the regularly updated dissemination list. The private section assists neuGRID internal communication, research and management activities. A document sharing application has been developed and is available, offering a useful platform to partners to share documents and files.

Particular attention has been paid to the home page. Most of the users will decide whether they stay and navigate the site or leave it depending on this first impression. It is, therefore, something more than the starting point for the rest of the information. It also instructs the user on the "language" that applies to this particular site in terms of colours, environment and, above all, navigational features.

The home page of the neuGRID project website reflects the following topics:

1. logo, identifying the project in order to attract visitor's attention;
2. the support provided by the European Commission is stressed by the legend "neuGRID has received funding from the European Community's Seventh Framework Programme (FP7/2007-2013) under grant agreement n°211714"
4. Tool buttons: a specific button has been designed allowing the user to enter the reserved area. A personal password and username has been provided to each partner;
5. Additional sections provide the following information: - Section "Highlights" gives a direct links to the project leaflet and photo gallery; - Section "News" provides information on project development.

The home page as well as neuGRID website's structure and contents have been described in Deliverable 4.1 *Dissemination and training plan*.

The project website is constantly monitored and updated. Access to the private area to teams' new members has been promptly provided. Relevant material (documents, dates, contact details) have been made available without delay.

The homepage of the website has been used to ensure visibility to dissemination events where the presence of the project was relevant, such as the HealthGrid annual conference or the MICCAI conference, by adding banners with direct links to the events' pages at the bottom of the neuGRID homepage.

Logo

Among the different possibilities available to represent the project (symbol, identifier...) the Consortium agreed to produce a logo epitomizing the aspects that are addressed by neuGRID and giving it a unique identification.

The final logo has been described in Deliverable 4.1 *Dissemination and training plan*: it shows the image of a human head surmounted by a stylized grid, representing the interaction between neuromedicine and grid-computing and, between human health and technology.

It has been used in all dissemination material distributed during scientific meeting and conferences at national, European and international level.



Video

In June 2009 the Consortium – thanks also to the support of the Project Officer B. Fabianek – started evaluating several video production services for the production of a professional video introducing the neuGRID project. After soliciting sample video material, the Consortium decided to award the realisation of the video to the English society “Xube”. A detailed quotation was received and logistical organisation of the filming was taken at P5 VUmc in March 2010, co-locating it with the consortium quarterly in-person meeting. A short and a long version of the video is available on youtube and linked to the project website and all dissemination material:

<http://www.youtube.com/watch?v=LR0CPFHUjZE&feature=related>
http://www.youtube.com/watch?v=n8_4f8q4DJ0

Poster

A GRID-BASED e-INFRASTRUCTURE FOR DATA ARCHIVING/ COMMUNICATION AND COMPUTATIONAL INTENSIVE APPLICATIONS IN THE MEDICAL SCIENCES

neuGRID e-infrastructure

What is neuGRID
 A new user-friendly Grid-based e-Infrastructure enabling the neuroscience community to collect and archive large amounts of imaging data and to access resources for computationally intensive data analyses.

User Communities
 Neuroscientists working in the field of Alzheimer's disease will have an integrated clinical and imaging database, coupled with algorithm management interfaces. **Algorithm Developers** will have a powerful testbed as well as access to a large community of neuroscientists that might exploit their products. **Pharma Industries** will be able to test disease markers for use as surrogate outcomes in clinical trials of drugs for neurodegenerative diseases.

The Infrastructure
 Level 0 provides the core services of the infrastructure ranging from the Grid Information System to neuGRID's database management facilities. Level 1 hosts the concrete computing resources in use by neuroscientists when acquiring data, specifying pipelines and testing new markers of brain diseases.

Use Case
 A researcher interacts neuGRID to select a group of images to process using their chosen pipeline. After processing on the grid is complete, provenance data is used to verify the output and the results are exported into the users tools for statistical analysis and advanced visualization.

Computing Resources
 In neuGRID, a grid-based dedicated Grid network is being deployed which will provide hundreds of CPUs paired with Terabytes of Storage capacity. Through the so-called Data Archiving and Computing Sites – DACS, additional resources such as local clusters and supercomputers will be attached and shared in the Infrastructure. End-users will thus access a potentially unlimited pool of computing resources to run large imaging and statistical analyses over the distributed database of standardized data.

Data Protection and Safety in neuGRID
 Specific attention has been devoted to data protection and data safety under the following case scenarios: **SCENARIO A:** clinical data/images collected from subjects specifically enrolled to be entered in the neuGRID infrastructure; **SCENARIO B.1:** clinical data/images previously collected in different research projects are archived in neuGRID; **SCENARIO B.2:** clinical data/images previously collected in different research projects are analyzed but not archived in neuGRID.

International Cooperation
CBRAIN (<http://cbrain.mcgill.ca>) is a network of Canada's five leading brain imaging research centres, linked within a Service Oriented architecture for distributed processing and databasing of brain imaging information. **LONI - Laboratory of Neuroimaging** (<http://www.loni.ucla.edu>) is a large research infrastructure at UCLA hosting the largest research imaging database worldwide in the field of neurodegenerative disorders. **AddNeuroMed** is a prospective multi-centre study of Alzheimer's Disease.

Giovanni B Frisoni (P.I.), Christian Spenger¹, Alex Zijdenbos², Richard McClatchey³, David Manset⁴, Frederik Barkhof⁵, Lars Josef Wahlund⁶, Tony Solomonides⁷, Carla Finocchio⁸

1) ICCS - Istituto Italiano - Centro Nazionale per la Ricerca di Alzheimer e la Malattia Neurodegenerativa, Trieste, Italy; 2) Proxima Informatica AG, Switzerland; 3) University of the West of England, Bristol, UK; 4) Royal College of Surgeons in Ireland, Dublin, Ireland; 5) Karolinska Institutet, Stockholm, Sweden; 6) The Netherlands; 7) Neurologisches Institut, Stockholm, Sweden; 8) "NeuroGrid" Project, "IC" - International Clinical Trials Group, Trieste, Italy

Grid project has received funding from the European Community's Seventh Framework Programme (FP7/2007-2013) under grant agreement n° 217114 (GRI-07-514662-000001)

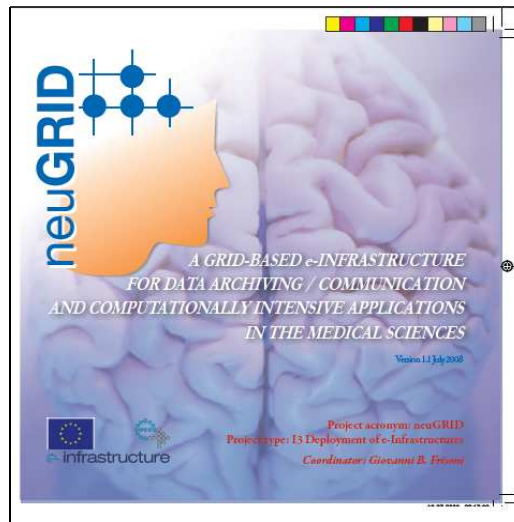
A project poster, highlighting the results of the project was produced and finalised with the collaboration of the entire Consortium. The poster was first presented during the MICCAI-Grid workshop at the Imperial College London (September 2009). Together with the rest of the dissemination material, this new version of the poster has been made available to partners through the project website.

Leaflet

An yearly update version of the project leaflet was produced, highlighting the results and the achievements of the different years of the project. These have been used as dissemination materials during meetings and international events. Each partners, as well as AB members and international collaborators, were provided with bunches of hard copies of the leaflet, to be distributed in the context of events as they might have felt appropriate. To see the full version of each leaflet see annex 2.

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Leaflet year 1 Cover



Leaflet Year2 Cover



Leaflet Year3



The final leaflet has been also disseminated at the Final Event at the European Parliament and is₁₉

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available on the project website for downloading.

Press releases

Short (1 page) press releases both in Italian and in English have been produced and used to approach journalists and journals to convey the results of the project to a wider audience, not limited to that belonging in the scientific and technologic fields. As a results, a number of articles appeared on the lay-press (see dissemination table for details), helping the consortium to reach and disseminate the results of the projects outside the boundaries of the scientific research.

Social Networking and non-conventional dissemination

The neuGRID consortium is represented on Facebook (<http://it-it.facebook.com/pages/neuGRID/123334147690239?v=info>). A three-fold page (in Italian, German and French) have been developed on Wikipedia - <http://it.wikipedia.org/wiki/NeuGRID>.

It is also available on **PRIMEUR WEEKLY**

(<http://enterthegrid.com/primeur/10/articles/weekly/AE-PR-08-10-76.html>)

CORDIS

WIRE(<http://cordis.europa.eu/wire/index.cfm?fuseaction=article.Detail&rcn=23448&rev=0>)

And

ALPHAGALILEO (<http://www.alphagalileo.org/ViewItem.aspx?ItemId=81398&CultureCode=en>)

7. Conclusions

NeuGRID is a concrete implementation of a new model of shared use of computing and data resources across diverse technological, administrative and national domains. Current developments indicate that the technologies underlying neuGRID are maturing quickly enough to support the emergence of this deployed e-Infrastructure which is expected to offer to scientists and clinicians means never available before, both in terms of available knowledge base as well as computing capabilities.

The dissemination activities described in this report were conceived and performed with the aim to spread these concepts in research, clinical and academic environments.

At this point (month 22), several dissemination activities have been performed by the Consortium. The success of these activities will be measured through the adoption of the e-Infrastructure by current and future multicentre project on Alzheimer's or other neurodegenerative diseases and the increasing number of users accessing the infrastructure for their daily work.

Annex 1 – Table of dissemination activities

DISSEMINATION ACTIVITIES - neuGRID - PAPERS/ARTICLES

N	Date	Type	Meeting title	Presentation type	Presentation title	Type of audience	Countries addressed	Size of audience	Partners	Relevance for neuGRID	Place	Presenter	Material
1	lug-08	Article	"maat Gknowledge, on the Cutting Edge of Biomedical Technology"	Others	---	French presidency welcoming reception	International	NA	P4 MAAT	Promote awareness of neuGRID at the highest political level	/	D. Manset	Article
2	Feb_2009	Article on scientific journal	-	---	Reusable Services for Grid-Based Health Applications	IT Scientistc	All countries	N.A.	P3 UWE, P4 MAAT	Experts and users in neuroimaging and other biomedical fields will attend the HealthGrid conference. The conference will provide a forum to discuss the neuGrid services architecture and get feedback on the submitted work. It will also help us to discuss the future research plans.	N.A.	A. Anjum	Article
3	28/05/09	Article on scientific journal	Public Service Review: Science and Technology n°3	Article	A Grid-Brained Infrastructure to Understand and Defeat Brain Diseases	Scientists, Politicians	Europe	N.A.	P4 MAAT, CO1 FBF, P7 HG	Raising awareness	n.a.	--	Article
4	25th July 2009	Article	IETE Technical Review	Journal Paper	Rule-Based Querying of Distributed, Heterogeneous Data.	Scientific	International		P3 UWE	Technical dissemination of neuGRID related research.		T. Lansdale	Article
5	28th June 2009	Article	Seventh HealthGrid Conference	Poster	Reusable Services from the neuGRID Project for Grid-Based Health Applications	Scientific	Europe	250	P3 UWE	Technical application of Grid technology within Healthcare domain.	Berlin, Germany.	Y. Mehmood	Article

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6	3rd August 2009	Article	22nd IEEE International Symposium on Computer-Based Medical Systems (CBMS)	Short Paper	A Middleware Agnostic Infrastructure for Neuro-Imaging Analysis	Scientific	International	200	P3 UWE	Technical application of ICT within Healthcare domain.	Albuquerque, NM, USA	P. Bloodsworth	Article
7	26 August 2009	Article on scientific journal	iSGTW International Science Grid this week	Article	Feature - Improving Alzheimer's research, a million scans at a time	GRID Scientists	Europe	iSGTW readers	P4 MAAT, CO1 FBF	Missing Info	N.A.	D. Manset, G. B. Frisoni	Article
8	16 September 2009	Article on scientific journal	GridTALK- GridBriefing	Article	The Future of Healthcare: eHealth and Grid Computing	Grid Scientists IT Experts	Europe	GridTALK readers	CO1 FBF, P7 HG	Missing Info	N.A.	---	Article
9	24 September 2009	Workshop at Scientific Event	MICCAI 2009	workshop	MICCAI-GRID, Medical Imaging on Grids, HPC and GPU-based Technologies Interoperability Highlight on NeuroSciences	GRID Scientists, IT, Neuroscientists	Europe, US, Canada	20	P4 MAAT, CO1 FBF	Missing Info	London, UK	D. Manset, G. B. Frisoni, C. Barattieri	Slides, Poster, Articles
10	8th December 2009	Article	All Hands Meeting 2009	Full Paper	Towards Intelligent Workflow Planning for Neuroimaging Analyses	Scientific	International	250	P3 UWE	Major E-Science forum	Oxford, UK	I. Habib	Article
11	30th January 2010	Web Journal	Le Scienze Web News	Article	Un'opportunità per la ricerca biomedica: la rete GARR	General	Italy	N.A.	FBF	Convey the project's results to a lay audience	-	C. Barattieri, C. Bagnoli	Article
12	3rd February 2010	Web site	www.key4biz.it	Article	eHealth: entra nella seconda fase la collaborazione tra Ministero Salute e GARR per nuovi servizi dedicati a comunità biomedica	General	Italy	NA	FBF	Convey the project's results to a lay audience	NA	C. Barattieri, C. Bagnoli	Article

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13	February 2010	Scientific journal	Nature Reviews Neurology	Article	The clinical use of structural MRI in Alzheimer disease	Scientific	International	Thousands	FBF	Dissemination to the neuroscientific community from a prestigious journal	Giovanni B. Frisoni, Nick C. Fox, Clifford R. Jack Jr, Philip Scheltens and Paul M. Thompson	Article
14	28th April 2010	Report	EEF Report	Report	ESFRI project requirements for Pan-European e-infrastructure resources and facilities	Scientific	International	Hundreds	FBF, the neuGRID Consortium	Dissemination among the connectivity providers community	B. Jones et al.	Report
15	31st May 2010	Newspaper	Giornale di Brescia	Article	Vanno in rete milioni di dati sull'Alzheimer	General	Italy	60.000	FBF	Convey the project's results to a lay audience	C. Barattieri, C. Bagnoli	Article
16	15th July 2010	Newspaper	Sole 24 Ore	Article	Italia guida neuGRID, primo laboratorio virtuale per lo studio dell'Alzheimer	General	Italy	N.A.	FBF	Convey the project's results to a lay audience	M. Cesta, C. Barattieri, C. Bagnoli	Article
17	16th July 2010	Journal	GARR News	Article	Quando medicina, rete e tecnologia si alleano	General	Italy	N.A.	FBF	Raising awareness in the Italian GRID community and connectivity providers	M. Vario	Article
18	16th July 2010	Web Site	AlphaGalileo	Article	neuGRID project	General	International	N.A.	FBF	Convey the project's results to a lay audience	C. Barattieri, C. Bagnoli	Article
19	16th July 2010	Web Site	Cordis Wire	Article	Alzheimer's Disease goes on the web	General	International	N.A.	FBF	Convey the project's results to a lay audience	C. Barattieri, C. Bagnoli	Article
20	19th July 2010	Web Site	Primeur Weekly	Article	Alzheimer's Disease goes on the web	General	International	N.A.	FBF	Raising awareness in the GRID and supercomputer community	C. Barattieri, C. Bagnoli	Article

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21	September 2010	Journal	GridBriefings	Article	Computacion Grid en cinco minutos	General	Spanish speaking countries	N.A. FBF	Raising Awareness in the GRID community	C. Barattieri, C. Bagnoli	Article
22	14th October 2010	Web Site	GEANT (http://www.geant.net/Media_Centre/News/Pages/GEANTtoastsSuccessesAtICT2010.aspx)	Article	GÉANT toasts highly successful showing at ICT2010	General	International	N.A. CO1 FBF	Raising awareness in the GRID and supercomputer community	C. Barattieri, G. Frisoni	Article
23	7th January 2011	Web Site	ePractice	Case	neuGRID	General	International	100 FBF	Convey the project's results to a lay audience	G. Frisoni	Article
24	26th January 2011	Web Site	www.agi.it	Article	Alzheimer: creato il 'google' delle immagini cerebrali	General	Italy	N.A. FBF	Convey the project's results to a lay audience	Hill & Knowlton	Article
25	26th January 2011	Web Site	http://vosquestionsante.blogs.dhnet.be	Article	Un grand coup d'accélérateur à la recherche sur la maladie d'Alzheimer	General	Belgium	N.A. FBF	Convey the project's results to a lay audience	Hill & Knowlton	Article
26	27th January 2011	Web Site	www.medicalnewstoday.com	Article	'The google for brain imaging' accelerates rate of research into Alzheimer's disease	General	International	N.A. FBF	Convey the project's results to a lay audience	Hill & Knowlton	Article
27	27th January 2011	Web Site	http://biomedme.com	Article	'The google for brain imaging' accelerates rate of research into Alzheimer's disease	General	Middle East	N.A. FBF	Convey the project's results to a lay audience	Hill & Knowlton	Article
28	28th January 2011	Web Site	http://ar.aswataliraq.info/	Article	هيبش تبحب لكرهم روصرلك ل غوغب قطبترملا تي غامدل رميازلأ ءادب	General	Arabian Countries	N.A. FBF	Convey the project's results to a lay audience	Hill & Knowlton	Article

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29	2nd February 2011	Newspaper	Giornale di Brescia	Article	Irccs. Il «google» delle immagini del cervello	General	Italy	N.A.	FBF	Convey the project's results to a lay audience	Hill & Knowlton	Article
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DISSEMINATION ACTIVITIES - neuGRID - PRESENTATIONS

N	Date	Type	Meeting title	Presentation type	Presentation title	Type of audience	Countries addressed	Size of audience	Partners	Relevance for neuGRID	Place	Presenter	Material
1	24/02/2008	Logo	logo neuGRID	Others	---	General Public	International	NA	P3 UWE + CO1 FBF	Mandatory	/	/	Logo
2	03/03/2008	Letter of intent	ANTARES Project application	Others	---	Scientific community	Romania	20	CO1 FBF	Build connections with neuroscientists from newly admitted EU member countries	/	G. B. Frisoni	letter of intent
3	31/03/2008	Teleconference	WW ADNI Teleconference	Operational teleconference	---	Scientific community	International	30	CO1 FBF	Update international Alzheimer's neuroscientists on neuGRID's progress	/	G. B. Frisoni	mail minute
4	12-16/04/08	Conference	Alzheimer's Disease Neuroimaging Initiative	Invited lecture	---	North American academic neuroscientists and industry representatives	USA, Canada, and International	200	CO1 FBF	Update international Alzheimer's neuroscientists on neuGRID's progress	Chicago, Illinois (USA)	G. B. Frisoni	Slides
5	23/04/2008	Website	neuGRID website	Others	---	General Public	International	NA	CO1 FBF	Mandatory	/	/	Website
6	27-29/04/08	Conference	Thessaloniki - EADC annual meeting	Invited lecture	---	Scientific community	EU	100	CO1 FBF	Update EU Alzheimer's neuroscientists on neuGRID's progress	Thessaloniki - Greece	G. B. Frisoni	Slides
7	21/05/2008	Workshop	Distributed Computing Workshop (EGEE)	Oral	---	Grid community	UK (London)	100-200	P3 UWE	Keep and create new links with the world wide grid community	London - UK	R. McClatchey	Leaflet

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8	04/06/2008	Meeting	IMI meeting	Oral	neuGRID: an e-Infrastructure for computational neuroscientists	Scientific community	UK (London)	30	CO1 FBF	Contact for future expansions of neuGRID	London - UK	G. B. Frisoni	Minute
9	2-4/06/08	Conference	HealthGrid 2008	Workshop at scientific meeting	---	Scientific Community, Policy Makers	Europe, USA, Asia-Pacific	150 - 200	P7 HEALTHGRID P4 MAAT P3UWE	Keep and create new links with the world wide grid community	Chicago, Illinois (USA)	Y. Legré, D. Manset, A. Zijdenbos	Leaflet, Slides
10	15-19/06/08	Conference	HBM - Human Brain Mapping	Hardcopy material distribution	Informal talks	Imaging scientists	International	1000	CO1 FBF	Disseminate knowledge about neuGRID to the worldwide neuroscientific community	Melbourne, Australia	G. B. Frisoni	Leaflet
11	13-17/07/08	Conference	CINP - Collegium Internationale neuro-psychopharmacologicum	Oral	Informal talks	Pharmacologists	International	3000	CO1 FBF	Disseminate knowledge about neuGRID to the worldwide neuroscientific community	Munchen, Germany	G. B. Frisoni	Leaflet
12	06/09/2008	Workshop	MICCAI Grid workshop	Stand at scientific meeting	Medical image computing and computing networks	Medical imaging and genetics researchers, informatics and scientists	International	1000	P4 MAAT + P3 UWE	Medical Imaging Community	New York - USA	A. Redolfi, D. Manset	Leaflet, Slides
13	08-11/09/2008	Conference	UK e-Science 2008 All Hands Meeting	Stand at scientific meeting	Crossing Boundaries: Computational Science, E-Science and Global E-Infrastructures	Scientists, Engineers, students	UK, Europe, USA and Asia	500	P3 - UWE	neuGRID pipelines can run on any middleware through the mechanism proposed in this demonstration and poster	Edinburgh, Scotland (UK)	A. Anjum, Y. Mehmood, I. Habib, R. McClatchey, P. Bloodsworth	Poster and Demonstration
14	17-19/09/08	Conference	EADC - European Alzheimer's Disease Consortium	Oral	Informal talks	Alzheimer's scientists	Europe	150	CO1 FBF	EADC members will be privileged neuGRID users	Bruxelles	G. B. Frisoni	Leaflet
15	22-26/09/2008	Conference	Enabling Grids for E-Science (EGEE08)	Oral	Grid computing, Grid Infrastructures for Science	Grid community	International	550	P4 MAAT, CO1 FBF, P7 HealthGrid	Grid Community	Istanbul, Turkey	D. Manset, Y. Legré, C. Barattieri	Poster, Leaflet, Stand Conference booklet

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16	30.09 - 06.10.2008	Workshop	Silk Board Meeting	Hardcopy material distribution	Informal talks	Scientific	Central Asia countries - Europe	50	P7 HEALTHGRID	Raise interest of Medical communities in Central Asia - General	Uzbekistan	Y. Legré	Leaflet
17	23-24/10/2008	Conference	ICT-BIO 2008	Oral	Computer Modelling and Simulation for Improving Human Health	Biomedical Community	Europe	500	P4 MAAT, CO1 FBF	Biomedical Community	Brussels	G.B.Frisoni, D. Manset	Leaflet
18	28/10/2008	Conference	DG-SANCO	Oral	Future Challenges of European Health and Consumers	Politics	Europe	600	P4 MAAT	Raise interest of Politics	Brussels	D. Manset	Leaflet
19	14/11/2008	Workshop	5th call for proposals under the e-Infrastructures topic of the FP7 "Capacities" Specific Programme	---	Informal talks	EU grid infrastructure experts, EC officers	Europe	50	CO1 FBF	Preparation of application for international cooperation	Bruxelles	G. B. Frisoni, C. Barattieri	Leaflet
20	24/11/2008	Preparatory Meeting	Preparatory meeting for PharmaCOG IMI proposal submission	Oral	Presentation of WP5 on clinical studies	Neuroscientists, Pharma companies	Europe	50	CO1 FBF	Potential user community	London - UK	G. B. Frisoni, A. Redolfi	Leaflet
21	24/11/2008	Conference	Grid Framework Project for Life Sciences in Auvergne Region	Hardcopy material distribution	Informal talks	Scientific/ Political	France	150	P7 HG	dissemination of neuGRID / potential collaborations	Clermont-Ferrand France	Y. Legré	Leaflet
22	25-26/11/2008	Scientific conference	ICT 2008 - Communication technologies at European level	Hardcopy material distribution	Informal talks	Scientific/ Political	Europe	4500	CO1 FBF, P4 MAAT, P7HEALTHGRID	dissemination of neuGRID / potential collaborations	Lyon, France	G.B. Frisoni, C. Barattieri, D. Manset, Y. Legré	Leaflet
23	29.11 - 5.12.2008	Scientific conference	International Symposium on Health disparities - RCMI workshop	Hardcopy material distribution	Informal talks	Scientific/ Political	USA - World	350	P7 HG	dissemination of neuGRID / potential collaborations	Hawaii	Y. Legré	Leaflet
24	9-13/12/2008	Scientific conference	EUAsiaGrid All Hands meeting	Hardcopy material distribution	Informal talks	Scientific	Europe - Asia Pacific	50	P7 HG	dissemination of neuGRID / potential collaborations	Taipei Taiwan	Y. Legré	Leaflet

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25	18-19/12/2008	Scientific conference	6th International Workshop on Frontiers of Information Technology - FIT 2008	Oral	Pervasive cloud computing: An Infrastructure for ubiquitous e-Science	Information/communication technologist	Pakistan, China, India, Sweden, UK, Austria, USA	500	P3 UWE	Presentation of a Grid-based infrastructure within a medical research context	Pearl Continental Hotel, Bhurban, Pakistan	A. Anjum	Slides
26	16/01/2009	Preparatory Meeting	GRISU' - Grid Sud steering committee meeting	Oral	neuGRID: an e-Infrastructure for computational neuroscientists	Grid managers in Southern Italy	Italy	20	CO1 FBF	Potential extension of neuGRID to southern Italy	Cagliari, Italy	G. B. Frisoni	Slides
27	21/01/2009	Scientific conference	Health Grids, Progress and Challenges	Invited lecture	Developments in HealthGrid technologies.	Mixed IT experts and clinicians.	Canada and Europe.	50	P3 UWE	Presentation of a Grid-based infrastructure within a medical research context	Lawson Health Institute, University of Western Ontario, London, Ontario, Canada	Richard McClatchey	Slides
28	23/01/2009	Operational Teleconference	First neuGRID teleconference with Advisory Board	Oral	Update on neuGRID activities at month 12	Advisory Board members	Europe, USA	8	All partners	Receive feedback from world experts about year 1 performance	NA	G. B. Frisoni, R. Mc Clatchey, A. Zijdenbos, D. Manset	Slides
29	26/01/2009	Preparatory Meeting	AddNeuroMed - neuGRID cooperation	Oral	neuGRID: an e-Infrastructure for computational neuroscientists	Neuroscientists, Pharma, Funding agencies	Europe, USA	80	CO1 FBF	AddNeuroMed is key partner	London - UK	G. B. Frisoni	Slides
30	28/01/2009	email	Contribute to the BELIEF Digital Library	Others	---	Scientific/ Political	Europe, International	NA	CO1 FBF	---	---	G. B. Frisoni	Leaflet, deliverables, facts sheet, logo
31	05/03/09	Forum	Open Grid Forum	Oral communication at scientific meeting	LORIS in neuGRID: an efficient database management system for data handling in the neuroimaging community	IT scientists	Italy, Europe	30	CO1 FBF	Addressed the OpenGrid Forum, update on status of work in the community	Catania, Italy	A. Redolfi	slides

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32	06/03/09	Workshop	Workshop Population Imaging	Oral Communication at Scientific Meeting	Vumc cohorts and GRID computing	neuroscientists from all Universities in Netherlands	currently only NL, possibly in future UEMS member states	40	P5 Vumc	potential EU network for Population-based imaging needing massive computing power	Rotterdam, The Netherlands	F. Barkhof	slides, leaflet
33	06/03/09	Workshop and Booth	OGF25 / EGEE User Forum Building Bridges in Healthgrids and Grids for e-Health	Oral Presentation and Live Demonstration	neuGRID Project Presentation	GRID Scientists	Italy, Europe	300	MAAT	GRID Community	Catania, Italy	D. Maset	Slides, leaflet
34	11/03/09	Conference	GRISU Annual Project Conference	Oral Presentation	neuGRID Project Presentation	Health Researchers	Italy	50	MAAT	Health Researchers	Naples, Italy	D. Maset	Slides
35	01/04/09	Slide Presentation	WW-ADNI	Oral Presentation at ADNI Industry Advisory Board	neuGRID update	Top Pharma representatives	US, International	30	CO1 FBF	Pharma is a potential prospective user of neuGRID	Seattle, US	M. Carrillo	slides
36	06/04/09	Slides presentation and demonstration	Centre for Mind/Brain (CIMEC)	Lecture	neuGRID: a grid-based infrastructure for the neurosciences	IT and neuroscientists	Italy	30	CO1 FBF	Local IT specialists should be aware of neuGRID aim and achievements	Rovereto, Italy	G. B. Frisoni, A. Redolfi, M. Lorenzi	slides
37	20-21/04/2009	Slide Presentation	EADC semi-annual meeting Imaging Group	Oral communication at scientific meeting	Imaging update - neuGRID	Scientists	Europe	50	CO1 FBF	EADC researchers will be the first non-neuGRID users and their attention to neuGRID should be kept alive	Genoa, Italy	G. B. Frisoni	slides
38	27/04/09	Slide presentation	External Advisory Board of US- ADNI	Oral Communication at Scientific Meeting	ADNI initiatives in Europe	Top ADNI representatives, top industry delegates	US	30	CO1 FBF	The selected audience can affect high decision making levels	Seattle	G. B. Frisoni	slides
39	28/04/2009	Slide Presentation	Annual Steering Group US-ADNI 2009	Oral Communication at Scientific Meeting	ADNI initiatives in Europe	Neuroscientists Pls of US ADNI centres, industry delegates	US	200	CO1 FBF	ADNI neuroscientists are potential international users.	Seattle	G. B. Frisoni	slides

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40	5 May 2009	Seminar	SMILE Day	Oral Presentation	NeuGRID: A modern way to do image analysis	Health Researchers	Sweden	50	P6 KI	Presentation of neuGRID for potential users	Stockholm, Sweden	L-O Wahlund	Slides
41	2nd June 2009	Conference	Joint Life Watch EGEE meeting	Slide Presentation	Architectural Considerations	Scientific	Europe	15	P7 HG	Presentation of the neuGRID infrastructure design as an example for the ESFRI Lifewatch. The goal is to have infrastructure and and thus validate the pertinency of our design.	Rome, italy	Y. Legré	Slides
42	2-4 June 2009	conference	OMG Conference on Service Oriented Architectures in Healthcare	Oral Presentation	Service Oriented Architectures in European HealthGrid Projects	Academics, Industry practitioners, standards bodies	US, Canada	70	P3 UWE	raising awareness in neugrid activities in service oriented architecture	Chicago, US	R. McClatchey	Slides
43	21-25 September 2009	Booth and Video Demo	EGEE'09 Conference	Oral Presentation	A Grid-Brained Infrastructure to understand and defeat Brain Diseases	GRID Community	Spain, Europe	Missing Info	P4 MAAT	Missing Info	Barcelona, Spain	D. Manset	Press release, video
44	20 September 2009	Slide Presentation	Fitness and Solidarity	Oral Presentation	NeuGrid	Journalists from local and national media	Italy	20	CO1, FBF	Enhance awareness at a local level	Municipality of Brescia, Italy	G. B. Frisoni,	Slides
45	24 September 2009	Workshop at Scientific Event	MICCAI 2009	workshop	MICCAI-GRID, Medical Imaging on Grids, HPC and GPU-based Technologies Interoperability Highlight on NeuroSciences	GRID Scientists, IT, Neuroscientists	Europe, US, Canada	20	P4 MAAT, CO1 FBF	Missing Info	London, UK	D. Manset, G. B. Frisoni, C. Barattieri	Slides, Poster, Articles
46	29 September 2009	Consultation meeting	Health ELSA	Slide Presentation	A way to predict the development of chronic brain disease	Scientists, Politicians	Europe	40	CO1 FBF	Enhance awareness of EC officers and networking with other european projects	Brussels, Belgium	G.B. Frisoni	Slides

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47	23-24 September 2009	HeC Conference at OPBG	Health-e-Child's contribution to diagnostics in paediatrics and the scientific potential of the Virtual Physiological Human approach	Slide Presentation	NeuGRID	Scientists	Europe	100	CO1 FBF	Networking with other European projects, enhance awareness among national decision makers and enhance awareness of national connectivity providers.	Rome, Italy	G.B. Frisoni	Slides
48	30 September 2009 - 02 October 2009	Garr Conference 2009	Network Humanitatis: linguaggi, risorse, persone	Slide Presentation	neuGRID: a grid-based infrastructure for data archiving/communication and computational intensive applications in medical sciences	Researchers and Technicians	Italy, Europe	200	CO1 - FBF	Strengthen potential partnerships with other virtual organization in the medical area	Naple, Italy	A. Redolfi	Slides
49	1st February 2010	Conference	Health Science Community: GARR e Ministero della Salute per la rete della ricerca medica"	Slide Presentation	neuGRID e outGRID: una infrastruttura elettronica globale per le neuroscienze computazionali	Scientific	Italy	100	FBF	Raising awareness in the Italian GRID community and connectivity providers	Milan, Italy	G.B. Frisoni	Slide Presentation
50	4th-8th March 2010	Conference	European Congress of Radiology	e-poster	neuGRID: A GRID-based e-infrastructure for data sharing and archiving, communication and computational intensive applications in the medical sciences	Scientific	International	80	VUmc, ProdeMa, UWE, MAAT, KI, HealthGrid, FBF	Raise awareness of the project at the EU level	-	K. S. Cover, A. Zijdenbos, R. McClatchey, D. Manset, L. O. Wahlund, Y. Legre, T. Solomonides, G. B. Frisoni, F. Barkhof	e-poster
51	23rd March 2010	Conference	ECRI 2010	Poster	neuGRID a grid based e-infrastructure for data archiving/communication and computational	Scientific	Spain	500	FBF, HealthGrid	Raise awareness of the project at the EU level	Barcelona, Spain	C. Barattieri, G. Frisoni, Y. Legré	Poster

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					ly intensive applications in the medical sciences								
52	April 2010	Web site	http://www.gridcafe.org/	Project Synopsis	NeuGRID: neuroscience	Scientific	International	N.A.	FBF	To raise awareness among the grid community	-	C. Barattieri	Synopsis
53	April 2010	Web site	Wikipedia	Multi-language Project Description (italian, french, german)	NeuGRID	General	International	N.A.	FBF	Convey the project's results to a lay audience	-	C. Barattieri	Description
54	13th April 2010	Conference	External Advisory Board of US-ADNI	Slide Presentation	ADNI-related initiatives in Europe	Top ADNI neuroscientist representatives, top industry delegates	Canada	150	FBF	Raising awareness among Alzheimer neuroscientists	Toronto, Canada	G.B. Frisoni	Slide Presentation
55	1st-7th May 2010	Conference	ISMRM 2010	Poster	neuGRID: A GRID-based e-infrastructure for data sharing and archiving, communication and computational ly intensive applications in the medical sciences	Scientific	Sweden	Hundreds	Vumc	Raise awareness of the project in the international MRI community	Stockholm, Sweden	K. Cover	Poster
56	May 2010	Web site	Alzheimer's Association	Credit	World Wide Alzheimer's Disease Neuroimaging Initiative	General	International	Thousands	FBF, the neuGRID Consortium	Dissemination at the societal level	-	G. Frisoni	Web page
57	15th July 2010	Conference	ICAD 2010	Slide Presentation	Key Elements of European ADNI and Moving Forward: What lessons can be learned for moving	Scientific	International	50	FBF	Raising awareness among Alzheimer neuroscientists	Honolulu, USA	G. B. Frisoni	Slide Presentation

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				forward?									
58	14th-17th September 2010	Conference	EGI Technical Forum	Slide Presentation	DECIDE: From neurological research to clinical praxis: a European e-Service to support the early diagnosis of neurodegeneration	Scientific	International	60	external presenter	Raising awareness in the GRID and supercomputer community	Amsterdam, The Netherlands	L. Leone	Slide Presentation
59	23rd September 2010	Meeting	DECIDE Kick off Meeting	Slide Presentation	e-Infrastructures for neurological research: neuGRID, outGRID and the way forward	Scientific	Italy	100	FBF	Raising awareness in the GRID and neuroscientific community	Rome, Italy	G. Frisoni	Slide Presentation
60	27th-29th September 2010	Conference	ICT 2010	Leaflet	GEANT at ICT 2010	Scientific	International	5000	FBF, MAAT, HealthGRID	Raising awareness in the GRID and supercomputer community	Brussels, Belgium	D.Manset, C. Barattieri, G. Frisoni	Leaflet
61	4th-5th November 2010	Conference	8th e-Infrastructure Concertation Meeting	Slide Presentation	DECIDE: From neurological research to clinical praxis: a European e-Service to support the early diagnosis of neurodegeneration	Scientific	International	50	external presenter	Raising awareness in the GRID and supercomputer community	Geneva, Switzerland	L. Leone	Slide Presentation
62	13th-14th December 2010	Meeting	CHAIN Kick off Meeting	Slide Presentation	DECIDE: From neurological research to clinical praxis: a European e-Service to support the early diagnosis	Scientific	International	50	external presenter	Build connections with other EU projects	Rome, Italy	L. Leone	Slide Presentation

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63	26 th January 2011	Seminar	Toward the development of effective drugs for Alzheimer's Disease	Conference	of neurodegeneration How e-Science can help solving pressing societal problems	General	International	50	FBF, the neuGRID Consortium	Raising awareness at the European Parliament level	G. Frisoni, R. McClatchey, D. Maset	Slides
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Leaflet Year3

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International Cooperation

Three e-infrastructures for computational neuroscience are presently active or under construction worldwide. In Europe, neuroGRID aims to provide large sets of brain images paired with grid-based computationally intensive algorithms for studies of neurodegenerative diseases. In Canada and the US, CBBAIN and LOIS Laboratory of Neuro Imaging at UCLA offer computational resources and algorithm pipelines. Aim of neuroGRID is to enable the process to unify these infrastructures to converge into one unique worldwide facility. neuroGRID will organize workshops to promote the exchange of technical information, direct the development of the infrastructures towards interoperability, and promote specific international calls aiming to achieve full interoperability.

Partners

University of the West of England
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 David Mottet, MAAT/Genomologie, France, Spain
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FACTS

Start date: 01.02.2008
 Duration: 36 months
 Funding from the EC: € 2.800.000
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A GRID-BASED e-INFRASTRUCTURE FOR DATA ARCHIVING/COMMUNICATION AND COMPUTATIONALLY INTENSIVE APPLICATIONS IN THE MEDICAL SCIENCES

Version 3.1 April 2010 - Achievements of year 2 of 3
 Project acronym: neuroGRID
 Project type: IS Deployment of e-Infrastructure
 Coordinator: Giovanni B. Frisoni

neuroGRID is a new user-friendly Grid-based e-Infrastructure enabling the neuroscience community to collect and archive large amounts of imaging data and to access resources for computationally intensive data analyses. Neuroscientists will be able to identify neuro-degenerative disease markers through the analysis of brain images and thanks to an innovative new set of distributed medical and Grid services. The infrastructure is designed to be expandable to other medical applications and is compliant with EU and international standards for data collection, data management and Grid technologies abstraction.

User Communities

Neuroscientists working in the field of Alzheimer's disease will have an integrated clinical and imaging database, coupled with algorithm management interfaces.
 Algorithm Developers will have a powerful testbed as well as access to a large community of neuroscientists that might exploit their products.
 Pharma Industries will be able to test disease markers for use as surrogate outcomes in clinical trials of drugs for neurodegenerative diseases.

Ethic Clearance

Privacy is a fundamental human right. The protection of privacy of personal medical data is important in any use of such data, but it becomes even more important in the context of health-care for the distributed nature of grids. For these reasons the consortium decided to develop a specific and unified protocol for privacy and data protection.

The Infrastructure

Level 0 provides the core services of the Infrastructure ranging from the Grid Information System to neuroGRID's database management facilities. Level 1 hosts the concrete computing resources in use by neuroscientists when acquiring data, specifying pipelines and testing new markers of brain diseases.

Data Challenge

neuroGRID has successfully passed the Second Data Challenge. The test experiment lasted about 2 weeks on the Grid, less than 1/100th compared to a single core. More than 5,000 MR scans from 715 patients were processed on 184 cores distributed in 4 countries, producing a total output of 1TB.

User Services

Database management LORIS has been refactored in order to meet the specific neuroGRID requirements and the neuroGrid-specific version of LORIS, LORISX, has been deployed and is undergoing testing. The main components of the new system, LORISX - data capture, data management and QC analyses tools - have now been developed and deployed and are undergoing testing with the neuroGrid infrastructure.

Generic Medical Services

Pipeline, Glueing, Provenance, Querying, Portal and Anonymization Services: neuroGRID Services provide generic functionality that is designed to span medical applications. They can be reused and are not dependent on the underlying infrastructure, whether grid or otherwise. The services have been designed and implemented following a service-oriented architecture paradigm, driven by a user requirements analysis; they enable users to specify workflows, track analyses/provenance, query and anonymize data and execute workflows in a middleware agnostic manner.

The final leaflet has been also disseminated at the Final Event at the European Parliament and is available on the project website for downloading.

Annex 3 – Final Event Report



Report: High-Level Seminar at the European Parliament - January 26, 2011

Executive summary

Event objectives

The seminar aimed to:

- Discuss the advancements being made on the innovative idea of building a global virtual imaging laboratory based on grid/cloud computing.
- Call for more action at the political level, generate support from EU policy-makers and advocate for an allocated budget, which will be necessary to implement neuGRID globally.
- Address the possible barriers to harmonisation, namely financial support, interoperability and transparency.
- Facilitate pan-European research on degenerative brain diseases and help develop effective treatments for these diseases.
- Igniting the process to lead these three e-infrastructures to converge into one unique worldwide facility.
- Promote the exchange of technical information, direct the development of the infrastructures towards interoperability and promote specific international calls aiming to achieve full interoperability.
- Increase awareness among policy-makers and populations of the great impact that research infrastructures could have on drug development and medicine as a whole.



This event creates an opportunity for a debate which will pave the way for actions at the political level. Today, we can work to facilitate a better budget line for the promotion of ICT for Health

said MEP Mario Mauro.



e-Science in action: about neuGRID/outGRID

neuGRID is a user-friendly online network that was created to dramatically accelerate the rate of research into Alzheimer's and other neurodegenerative diseases, facilitating the development of markers of disease progression (such as glycosylated hemoglobin for diabetes). These will foster the development of effective drugs in clinical trials.

The online platform provides neuroscientists across Europe with a vast database of 3D brain scans and powerful yet accessible computational tools to analyse them. It thus represents a platform of understanding and collaboration between ICT technical experts and the clinical community.

The neuGRID project, which was implemented from 2008-2011, achieved a major success in September 2009 when it extracted an Alzheimer's disease marker through the use of neuGRID's online archive of thousands of brain scans. With the use of the neuGRID infrastructure, a process that used to take as much as five years was completed in only two weeks. Now that neuGRID has proven its usefulness, the next step will be to harmonise and unify the neuGRID infrastructure with similar networks around the world. outGRID, neuGRID's international umbrella organization, is currently working to coordinate projects across the United States, Canada and Europe.

neuGRID is currently funded by the European Commission. However, in order to maximise the effectiveness of the platform, the project needs to be implemented globally. Harmonizing neuGRID with the few but significant homologous initiatives worldwide will increase the data available, and in turn, render the analysis of brain images significantly more conclusive.

outGRID was created to foster harmonisation and collaboration between neuGRID and two major initiatives in the US and Canada. In Canada and the United States, CBRAIN and the Laboratory of Neuroimaging at UCLA (LONI) currently offer computational resources and algorithm pipelines. By shifting the brain scan analysis process to cloud-computing and delocalising all data to a global, online platform, outGRID will ultimately lead to the development of a user friendly, easily accessible global virtual imaging laboratory.

Event conclusions

On EU initiatives for the development of new technologies for medical research:

- ICT sector is a key tool to finding new drugs.
- Funding for research in new innovative computing systems should be increased.
- Governments should start investing in the link between research and innovation, which will ultimately lead to healthier lives.

Challenges ahead:

- The global online network should provide a provenance system in neuGRID allowing users to determine where the medical data comes from.
- In order to make sure that the quality and capacity of the infrastructure is fully used, it is necessary to ensure the complete transparency of the software .
- The question of interoperability remains the major technical obstacle. Establishing a system that is operable and downloadable from anywhere around the world, and useable by any medical expert, is the key priority.

Next steps:

- Advocating for continued financial support which is necessary to develop a global infrastructure.
- Continuing expert discussions on improving worldwide interoperability.
- Increasing awareness among policy-makers and the public on the role that innovative technologies can play in helping the research for neuro-degenerative diseases, through the organisation of informative seminars.



If this infrastructure is made global, the long term scenario is that many more scientists will contribute to the successful development of disease markers for Alzheimer's disease, the markers will be used in clinical trials, and the drug development process will be greatly facilitated

explained Dr. Giovanni Frisoni.



Event overview

The seminar event brought together a total of 60 guests, including technical scientists from Europe and North America, policy officers from DG Research and DG INFSO, and a number of third party organisation members and European medical professionals. The objective of the event was to create momentum for debating how the link between computational power and medical research could be put to best use. There was unanimous agreement that funding for research in new innovative computing systems should be increased, and that the ICT sector was a key tool to finding new drugs.

The structure of the event comprised of three parts: an introductory outline of the role which ICT and innovation play in research; a technical outline of the existing grid-computing infrastructures in Europe, the U.S and Canada; and a policy roundtable on the outreach and future of the project.

Speakers and panellists

The event featured a range of high-profile speakers and participants. The policy part involved speeches by Mr. Robert Madelin, Director General INFSO and Mr. Mario Campolargo, Director of Emerging Technologies and Infrastructures at DG INFSO. The technical section comprised presentations by Dr. Giovanni B. Frisoni, Coordinator of neuGRID and outGRID and Deputy Scientific Director of the IRCCS Fatebenefratelli Institute in Brescia, Italy; Prof. Richard McClatchey, Technical Supervisor of neuGRID and Research Director of the Centre for Complex Cooperative Systems, University of the West of England in Bristol, UK; Dr. Alan Evans, Principal Investigator of CBRAIN in Montreal, Canada; and Mr. David Manset, Technical Coordinator of outGRID and CEO of maatG in Archamps, France.

The presentations were followed by a policy roundtable. The aim of the panel discussion was to identify common grounds for partnership and address any obstacles to the development of a fully compatible system at the global level. Composed of North American researchers and European policy-makers in the fields of research and information technologies, the panel was able to bring together perspectives that are relevant and necessary to the global implementation of the neuGRID/outGRID projects. Mr. Rémi Quirion, Executive Director of the Canadian Institute of Health Research in Montreal, discussed the current developments in the area of cloud-computing in Canada.

Two members of the European Commission's Directorate General for Information Technologies, **Mr. Kostas Glinos**, Head of Geant & e-Infrastructures Unit, and **Mr. Pēteris Zilgalvis**, Head of ICT for Health Unit, expanded on the Commission's current and planned involvement in e-Infrastructures. **Dr. Philippe Cupers**, scientific officer in the Major Diseases Unit and Joint Programming Representative at DG Research, **advocated a comprehensive approach on technology for the improvement of drug treatments in Europe**, an opportunity enabled by Joint Programming. **Ms. Karin Lohmann**, WP Chair Process Plan in Euro-Imaging, promoted the deployment of biomedical imaging infrastructure in Europe and fostered the liaison and cooperation of all relevant experts in Europe.

Policy landscape

All participants were focused on the options for working together to make this research platform a global tool for medical research. **Mr. Mario Campolargo**, who introduced Mr. Madelin and chaired the first two parts of the event, emphasised that this project was addressing an issue which was not only European, but global.

The current lack of awareness with regards to the need for a harmonised effort is mirrored in the still insufficient public resource allocation. In view of this situation, the speakers all called for a revision of the current mindset, and referred to the neuGRID project as a great example of the promising prospects for drug development. **MEP Mario Mauro**, who hosted of the event, called for more action at the political level. He explained that the challenges ahead laid in sensitising policy-makers and populations of the great impact which research infrastructures could have on drug development, and medicine as a whole.

"Scientific research can help solve health problems which are present in every house and every street around us", stated Mr. Madelin. "We should see neuGRID and outGRID as the platforms that will begin to bring solutions. We should overcome the tendency of the neuroscientists to resist cross-disciplinary work. neuGRID is the perfect example of the sort of scientific cooperation that the world requires today."



Such discussions are crucial in generating the broad support without which scientific endeavours could not bear fruit

emphasised the Director General INFSO
Mr. Robert Madelin.



Technical overview

Dr Giovanni B. Frisani explained that Alzheimer's disease develops because, over time, two toxic proteins accumulate in a patient's brain. For maybe 10 or 20 years, the disease remains asymptomatic. After a certain threshold, mild memory problems start to appear. Previously, we were diagnosing the disease on clinical ground within the dementia window, but we now believe that we can diagnose the disease earlier, before the symptoms appear through the extraction of a disease marker. "The long term scenario is that we will be able to pick patients with very early Alzheimer's and develop effective drugs on this population. The drugs will hopefully prevent the loss of self sufficiency and keep the patient in the window of mild memory loss." In this complex chain, neuGRID aims to foster the implementation of drug trials.

Prof. Richard McClatchey: the approach used to develop neuGRID was to consult the end user community, run requirements analyses and technical reviews, and test the prototypes with periodic data challenges. "Having reached the extraction of marker in 2009, we focused throughout 2010 on training scientists to use the infrastructure prototype, and used the feedback received to build a business plan for the future." The development of a provenance server in neuGRID was developed specifically so that people can determine where the data come from.

Prof. Alan Evans: Similar activities have been running in Canada and the US, notably with the creation of CBRAIN in Montreal (McGill University) and LONI in Los Angeles (UCLA), two platforms similar to neuGRID which allow to process data in flexible manner. **Our ultimate objective is to expand this process at the global level, and create one single interoperable online platform for research.** "The scientific projects currently undertaken in various parts of the world are highly compatible, and we should now work on ways to make them converge."

David Manset: "outGRID aims at promoting interoperability between the three infrastructures, CBRAIN, neuGRID and LONI". Facing the task of reaching semantic interoperability, meaning, solving the question of how to make one system understand the other, the outGRID developed a preliminary prototype. "If the current tests succeed, we will be able to prove the reliability and viability of the concept, and start developing a grid-cloud based infrastructure for neuroscientists to expand biomarkers development, especially for Alzheimer's, reduce costs of clinical trials, accelerate the rate of research for new drugs, and improve care and health of patients. We therefore need the strong commitment of decision-makers to initiate a larger effort of development worldwide."

Roundtable and Q&A

During the roundtable, panellists discussed the **interoperability between CBRAIN in Canada, LONI in Los Angeles, and neuGRID in Europe**, and address the possible barriers to harmonisation. **Mr. Rémi Quirion** gave an overview of the initiatives currently under way at the Canadian Institute of Health Research (CIHR), which are seeking to implement an international collaborative research strategy combining clinical research, personalised research, genetics, Alzheimer's and dementia. Mr. Quirion concluded by stating that the priority was for partners to identify common priorities on research and establish funding and support necessities. "I hope that the outcome of today's conference is that Alan (Dr. Alan Evans) will knock on our door asking to partner with his team and with the Europeans."



We are open for business; we want to partner with colleagues around the world. We can have an impact in terms of treatment

said Mr. Rémi Quirion.



The question of interoperability remains a challenge but should not be an obstacle. Such events are organised to ensure that all compatibility issues are overcome. **Mr. Kostas Glinos** explained that we are entering an era where e-infrastructures are important because they allow sharing. Knowledge sharing has great potential, but a number of obstacles, such as interoperability issues, need to be removed. "The challenge today is not how the science itself, but the way you use it. neuGRID and outGRID are a testament of an effort to remove such obstacles to allow scientific progress to advance enormously. This should be a convincing argument to increase funding in the area of e-infrastructures." For this reason, the Commission will publicise a number of documents outline its plans in terms of access and sharing and its views for the next framework programme.

Changes at the EU policy level are noticeable, notably with the funding for research currently having reached 100 million Euros a year. However, in order to make sure the quality and capacity of the infrastructure, complete transparency of the software is crucial, so that neuro-scientists know the scope of the software tools they are using. **To achieve this, the tasks of the ICT for Health Unit will be to analyse the current barriers to innovation and map existing initiatives.**



Seeing the crucial role which innovation plays in the Europe 2020 Strategy, it is now important to turn societal challenges into opportunities, and start investing in the link between research and innovation, and ultimately build prospects for healthier lives

explained Mr. Pēteris Zilgalvis.



Mr. Philippe Cupers provided an overview and political horizon of the Joint Programming on Neuro-Degenerative Research (JPNDR). Behind the establishment of this initiative was the desire to develop a common strategy to address certain societal problems, in this case, neuro-degenerative diseases. **The JPNDR is a voluntary platform which allows Member States to join, share ideas, and maximize the efficiency of national funding schemes.** The commission will hold an observer role. Throughout this year, the board will define its strategic agendas and priorities, and launch its pilot call, which might be: "Harmonisation of Cerebrospinal Fluid Biomarkers for Neurodegeneration" (tentative topic). The pilot project will be implemented in 2012.