Project no. 034567

Grid4All

Specific Targeted Research Project (STREP)

Thematic Priority 2: Information Society Technologies

D6.2: Dissemination and Use Plan

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

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Abbreviations used in this document

Abbreviation / acronym	Description
API	Application Program Interface
APPA	Atlas P2P Architecture
BPEL4WS	Business Process Execution Language for Web Services
BSD	Berkeley Software Design
CPU	Central Processing Unit
ETSI	European Telecommunications Standards Institute
EU	European Union
FP6	6th Framework Program
GGF	Global Grid Forum
GPL	General Public License
HW	Hardware
IEEE	Institute of Electrical and Electronics Engineers
IETF	The Internet Engineering Task Force
IPR	Intellectual property Rights
IRTF	Internet Research Task Force
IST	Information Society Technology
IT	Information Technology
JXTA	Sun Microsystems' set of open-source peer-to-peer networking protocols
LGPL	Lesser General Public License
NoE	Network of Excellence
OASIS	Organization for the Advancement of Structured Information Standards
OGF	Open Grid Forum
OSS	Operational Support System
P2P	Peer-to-Peer
PDA	Personal Digital Assistant
SME	Small and Medium Enterprise
SW	Software
VAR	Value-Added Reseller
VO	Virtual Organisation
VOFS	VO-aware file system
W3C	World Wide Web Consortium
WP	Work-package
WSIF	Web Services Invocation Framework

Grid4All list of participants

Role	Participant N°	Participant name	Participant short name	Country
CO	1	France Telecom	FT	FR
CR	2	Institut National de Recherche en Informatique en Automatique	INRIA	FR
CR	3	The Royal Institute of technology	KTH	SWE
CR	4	Swedish Institute of Computer Science	SICS	SWE
CR	5	Institute of Communication and Computer Systems	ICCS	GR
CR	6	University of Piraeus Research Center	UPRC	GR
CR	7	Universitat Politècnica de Catalunya	UPC	ES
CR	8	ANTARES Produccion & Distribution S.L.	ANTARES	ES

1. Executive Summary

The Grid4All project aims to enable domestic users, non-profit organizations such as schools and small enterprises to share their resources and to access Grid resources when needed, envisioning a future in which access to resources is democratized, readily available, cooperative and inexpensive. Spreading this idea of "Grid democratization" entails appropriate dissemination and exploitation actions in order to reach the user groups targeted by the project including not only the scientific community (in the field of Grid/P2P systems or beyond) but also the end user community (notably in the education sector).

This document describes the Dissemination and Exploitation Plan of the Grid4All project. The dissemination strategy includes the following actions aimed at maximizing the public visibility of the project:

- Setting-up of a public Web site and periodic release of newsletters
- Submission of research papers to conferences and workshops
- Organization of workshops centred on Grid4All topics
- Collaboration with other European projects (as detailed in the Grid4All Collaboration Plan)
- Setting-up of test-beds on well-known large-scale platforms such as Grid'5000 or PlanetLab.

On top of that, the project plans to set up pilot studies in real world settings involving schools, parents and pupils.

The Grid4All exploitation plan revolves around an open-source approach with the prospect of creating an open-source community of users and developers of the Grid middleware as wide as possible. Grid4All results will be provided to relevant standardization bodies and interoperability with globally accepted standards will be an important requirement. Regarding business perspectives, this document sketches the market model underpinning the market-oriented Grid environment targeted by the project and explains how each partner will fit in this model. The ability of the Grid4All infrastructure to be used on a commercial or non-for-profit basis opens up a wide range of business scenarios involving different and dynamic business relationships between the various stakeholders (business-to-consumer, business-to-business, consumer-to-consumer).

The two industrial partners within Grid4All, Antares and France Telecom, will investigate how to commercially exploit the results of the project: Antares from the point of view of identifying commercial software offerings (tools and applications), France Telecom from the point of view of transferring the technology to in-house projects developing new value-added services for residential users as part of their high-speed Internet access offer.

The present Dissemination and Exploitation Plan will be updated in the course of the project leading up to a consolidated technology implementation plan at the end of the project.

2. Overview

The target audiences for the Grid4All dissemination and use plans can be classified as follows:

a. Scientific and technical audiences. Grid4All will share and promote results with the scientific community and receive useful technical feedback.
b. Standardisation bodies. Grid4All will monitor and influence the development of standards within bodies such as GGF, W3C, OASIS, and IETF in order to encourage industrial acceptance of Grid4All middleware and services.
c. Collaborative projects. We aim to establish a synergy in technical and dissemination activities with other IST projects with objectives to optimise the resource usage in case of shared interests and increase impact.
d. Potential end market segment
e. Business and marketing units, opinion makers
f. Value added resellers, software industries, developers, and service providers: promote usage of Grid4All middleware to encourage development/enhancement/integration of value added tools and services and also deployment of Grid4All middleware components. Grid4All documentation will address these audiences to train them with Grid4All solutions, show them of the benefits of the developed middleware, and present deployment opportunities.

The exploitation and dissemination plans for Grid4All productions can be classified in the following categories:

*   Exploitation:
    o   Business and marketing: The exploitation manager will guide Grid4All from the point of view of marketing and business.
    o   IPR management: Open source based development of middleware with well chosen licensing models protecting permitting the protection of specific partner IPR provides a compromise between acceptance of Grid4All middleware in the large technical and user community and also the commercial interests of the partners.
    o   Evaluation within realistic test bed: WP4 will provide representative use scenarios which will be taken into account in the architecture and specification of Grid4All technical modules. Validation of software on realistic test beds will provide a high degree of confidence on the feasibility of the Grid4All technical approach.
*   Standardisation: Monitoring and influencing relevant standards is a key objective of Grid4All. Standardisation is important to encourage industrial acceptance of middleware and service platforms.
*   Communication: Regular communication of Grid4All use and applicability to different target audiences. Participation and demonstration of Grid4All in public events. Communication activities will give a public relations focus to Grid4All. Different target communities of interest to Grid4All have been identified and classified. The main approach is to:
    o   (a) leverage each partner's public relations channels to help write documentation promoting Grid4All (simple information and synthetic presentation for non-expert people)
    o   (b) identify meaningful public events (e.g. local and regional science fairs) where Grid4All can be promoted through posters and demonstrations.
*   Collaboration: The reader is invited to refer to the Grid4All collaboration plan [1] for more details about collaborations planned with other European projects and about standardization activities.
*   Dissemination: all partners will regularly communicate technical results to the scientific and research communities by attending workshops and conferences and through the publication of specific papers.

The outline of this document is as follows. Section 3 details the dissemination actions planned or already implemented by Grid4All as well as the tools that will be set up to raise the public awareness. The Use Plan covered in section 4 will present the overall strategy of the Grid4All consortium as well as the individual plans for each partner.

3. Dissemination Plan

The main thread leading the dissemination strategy of the Grid4All is to spread around the idea of "Grid democratization". In this respect a set of tools and proprietary actions will be developed in the course of the project to contribute to the public awareness. These actions and tools are the heart of the Grid4All dissemination plan and detailed in the sections below.

3.1 Dissemination tools

3.1.1 Grid4All public website

A dedicated project web-site is set up at http://www.grid4all.eu, in which publishable results of the Grid4All project will be made available. The site will publish information about the progress of the project and it will be maintained by all consortium members. At least one person from each partner will be authorized to make additions/changes to the web site, using a web interface which is already available. A very simple sitemap of the web site is shown below:

- Calendar: Information about project's specific events organized by date.
- Contact: Information for contacting the people involved in the project.
- Deliverables: Deliverables that can be publicized will be available here.
- Description of the consortium: Description of the contractors involved in the project including their role within Grid4All
- Description of the project: Description of the project core objectives and expected results
- Dissemination Material: presentations made at public events
- Flyers & Posters
- Grid4All Events: Grid4All newsletters. An electronic newsletter will be produced every six months in order to inform interested parties regarding project status, news and achievements. The responsibility of newsletters preparation will be shared among all project partners. The first newsletter will be released in early February 2007.

A screenshot of the public website is shown below:

3.1.2 Promotional and public relations material

To address the markets targeted for potential exploitation, the consortium marketing divisions and public relations offices will assist in the design of promotional material. Specific media opportunities will be identified to diffuse Grid4All results in a way that is amenable to the target market (Service providers, SMEs, general public as end user, VARs). The project will identify and participate within regional events such as science and trade fairs targeting the specific audience. Input based on expertise from market departments will be gathered to design project web pages and present information addressing specifically to a non-technical user audience.

3.2 Test-bed & Pilots

3.2.1 Test-bed deployment

The targeted test-beds for demonstrating the ideas of the project are acknowledged and have either a national or international profile. These test-beds will not only offer a concrete mean of proving the project's work ideas but will also serve as a strategic communication tool to reach other actors using these test-beds or industry watchers following the results obtained. The three candidate Grid test-beds targeted by the project are:

- PlanetLab is a test-bed for experiments with network services bringing to Grid4All the advantages of scale. This test-bed offers the ability to experiment under real-world scenarios and potential for real workload and users. The PlanetLab test-bed consists of more than 175 nodes distributed at 60 research centers around the world. France Telecom, KTH and the Universitat Politécnico de Catalunya (UPC) are the three members of the Grid4All consortium that host PlanetLab nodes. PlanetLab is a natural fit for the P2P overlay infrastructure of Grid4All since it offers a distributed virtualization layer allowing the coexistence of multiple overlay services. Moreover the variable latency and bandwidth experienced by PlanetLab hosts will contribute to keep the evaluation as close to the real-world conditions.

- Grid'5000: This belongs to a novel category of research tools for Grid and P2P system studies: a large scale distributed platform that can be easily controlled, reconfigured and monitored. Grid'5000 is currently composed of 2500 CPUs, distributed over 9 sites in France. The sites are connected through the RENATER network with 10 Gbps connections. The main difference between Grid'5000 and previous real life experimental platforms is its degree of flexibility in reconfiguration, allowing researchers to deploy and install the exact software environment they need for every experiment. The user also has the possibility to repeat experiments under the same experimental conditions. Grid'5000 security is established by using a virtual domain spanning over the 9 sites, strongly controlling the communications at the domain boundaries and relaxing restrictions for intra-domain communications. The platform provides users with many probes capturing the network/CPU/Memory/Disc usage during experiments. Grid'5000 receives funding from the French ministry of Research, the INRIA, CNRS, RENATER, the ACI Grid and ACI MD incentives, several Universities and regional councils. Concerning the usage of Grid'5000 in European projects, the current policy, because of the resource limitation, is to grant access to Grid'5000 only to European computer science researchers directly collaborating with a French counterpart. The number of CPU hours allocated to every project is subject to negotiation with Grid'5000 and discuss within the Grid'5000 steering committee.

- CSLAB: This large computing infrastructure comprises several high end UNIX servers and various PC clusters with high performance interconnects. These clusters constitute work horse platform for both research in communication architectures and high performance applications. These facilities can be accessed by all partners of Grid4All through the life of the Project.

3.2.2 Pilots

In order to reach out to the end user communities targeted by Grid4All, in particular in the field of education, the project has identified several organizations which it plans to contact with the prospect of (i) getting some

feedback on the concept of community grid proposed by the project and its relevance for educational or community-based projects and (ii) for setting-up possible pilots studies and user trials in a real world environment.

Active and potentially interested communities and organizations include:

- Association for Progressive Communications (www.apc.org) (world-wide activities and partners)

    APC is an international network of civil society organisations dedicated to empowering and supporting groups and individuals working for peace, human rights, development and protection of the environment, through the strategic use of information and communication technologies (ICTs), including the Internet.

- International Education and Resource Network (www.iearn.org) (with many partners world-wide)

    iEARN is the world's largest non-profit global network that enables teachers and young people to use the Internet and other new technologies to collaborate on projects that both enhance learning and make a difference in the world.

- National networks of schools in Spain:
    - Entidad pública Red.es (www.red.es)
    - Centro Nacional de Información y Comunicación Educativa (www.cnice.mec.es)

- Parents's associations and socio-educational associations in France ("Foyers socio-educatifs" in France are non-for-profit organizations comprised of teachers and parents which aim to foster cultural activities in high schools at a national or international level)

3.3 Schedule of dissemination activities

3.3.1 Grid4All workshop

One workshop will be organized by the Grid4All consortium. This event will be the opportunity to present all results achieved by the project.

3.3.2 Dissemination events

The following table lists references to Scientific Conferences, which are monitored by the Consortium partners against the dissemination and exploitation objectives.

N°	Title of Conference	Organisation	Date	Venue	Contractor	Item presented	Audience
1.	International workshop on high-performance data management in Grid environments (HPDGrid 2007)	VECPAR	July 13, 2006	Rio de Janeiro, Brasil	INRIA	Project Presentation and expected results	scientific
2.	International Workshop on Peer-to-Peer Systems (IPTPS'07)	Microsoft Research, ETH Zurich	February 26-27, 2007	Bellevue, WA, USA	ICCS	Technical results on P2P storage	scientific
3.	International Parallel & Distributed Processing Symposium (IPDPS 07)	IEEE, ACM	March 26-30, 2007	South Beach, CA, USA	ICCS	Technical results on P2P storage	scientific

N°	Title of Conference	Organisation	Date	Venue	Contractor	Item presented	Audience
4.	Workshop on Large-Scale and Volatile Desktop Grids (PCGrid 2007)	INRIA Futurs (Sponsored by Google)	March 30, 2007	Long Beach, California U.S.A.	INRIA	Project presentation and expected results	scientific
5.	Workshop on global and P2P computing (CP2PC'07)	IEEE/ACM	May 14-17, 2007	Rio de Janeiro, Brasil	INRIA	Project Presentation and expected results	scientific
6.	International Symposium on Cluster Computing and the Grid (CCGrid 2007)	IEEE	May 14-17, 2007	Rio de Janeiro - Brazil	UPC	Technical results on decentralized economic algorithms	scientific
7.	International Conference on Autonomic Computing	IEEE	June 11-15, 2007	Jacksonville, Florida, USA	UPC	Technical results on decentralized economic algorithms	scientific
8.	International Conference on Distributed Computing Systems	IEEE	25-29 June, 2007	Toronto, Canada.	UPC	Technical results on P2P algorithms	scientific
9.	International Conference on Grid Computing (Grid 2007)	IEEE	September 19-21, 2007	Austin, Texas, USA	UPC	Technical results on decentralized economic algorithms	scientific

3.3.3 Calendar list of results available for dissemination

The following table reporting results available for dissemination will evolve during the project life. .

No	Project Result	Timing of availability	Dissemination / Use
1.	State of the art analysis of structured overlays (peer-to-peer) and component models. Requirements for component model for self-managing overlays.	1 year	D
2.	Specification and initial prototype(s) of overlay services	2 years	D
3.	Specification and Models for ACF	2 years	D
4.	Preliminary specification and formal model of the extended component model and demonstrators for hierarchical self-management functionality.	2 years	D
5.	Full specification and final prototypes of overlay services.	2-2,5 years	D

No	Project Result	Timing of availability	Dissemination / Use
6.	Final report on the extended component model with provisions for construction, management and composition of overlay services as components, including case studies.	2,5 years	D
7.	Requirements for Grid4All Virtual Organization and Resource Management and State of the Art analysis	1 year	D
8.	Specification and initial prototype of the Grid4All autonomous VO management framework	2 years	D
9.	Specification and initial prototype of Grid4All Resource Management System	2 years	D
10.	Integrated prototype of Grid4All autonomous VO management framework	2,5 years	D
11.	Integrated prototype of Grid4All Resource Management System	2,5 years	D
12.	Requirements analysis, design and implementation plan Grid4All data storage and sharing facilities.	1 year	D
13.	Interface specification and initial running prototype of the Virtual Block Store.	1 year	D/U
14.	Specification and proof-of-concept adaptation of Distributed File Servies (DFS) and VO-aware file system (VOFS) on a fully functional VBS.	2 years	D
15.	Design and initial prototype of Semantic Store.	2 years	D
16.	Implementation of Semantic Store layered above VBS+DFS.	2,5 years	D/U
17.	Implementation of VO-aware file system;	2,5 years	D/U
18.	Evaluation of VOFS and Semantic Store in the context of collaborative applications	2,5 years	D
19.	Specification of scenarios, user requirements, and infrastructure requirements	1 year	D
20.	Specification of situations derived from applications	1 year	D
21.	Prototype API for Grid4All based applications	2 years	D/U
22.	Prototypes of application and selective transparency	2 years	D/U
23.	Integrated prototype of Grid4All applications	2,5 years	U
24.	First integrated intermediate prototype and evaluation report	2 years	D
25.	Final integrated proof-of-concept implementation and evaluation report.	2,5 years	D/U

3.3.4 Publications

The table below will be completed when publications are available.

Publication Title	Date	Author	Distribution (event)	URL
Internet Computing, IEEE Computer Society Press, (ISSN 1089-7801)				

3.4 General rules for dissemination

3.4.1 Style of presentations

The consortium has already decided on a corporate look including a common presentation template, which contains the Grid4All, EU IST and FP6 logos (such as the current document front page). All presentations will be available in this template.

3.4.2 Acknowledgements to the European Commission

All external presentations and publications concerning Grid4All will include the following elements:

1. "*project partially funded by the EU through the project IST-2005-034567 Grid4All in the IST priority of the 6th framework programme*"

2. IST, FP6 logos

4. Use Plan

4.1 Overall Grid4All strategy

The main motivation underpinning the Grid4All project is the prospect of bringing the benefits of Grid technology "to the masses" beyond the user community targeted by Grid Computing, namely, the scientific or industrial community. Spreading the idea of "Grid democratization" will be achieved by different means:

- Dissemination activities as detailed in section 3 (public Web Site, workshop organisation, scientific publications etc.).
- Test-bed deployment: the targeted test-beds for demonstrating the ideas of the project are all well-known and have a high national or international profile (e.g., PlanetLab worldwide, Grid'5000 in France). These test-beds serve as a strategic communication tool to reach other users or industry watchers following the results achieved.
- pilot studies: as well as simulated environments on test-beds, it is our intention to plan pilot studies in a real setting involving schools, local community centres and parents of school children.
- standards bodies: the Grid community is organising itself more and more around a number of (unfortunately sometimes competing) standards bodies. It will be important to be present in these bodies to lobby and push ideas.

In terms of exploitation, the key exploitable results of the project are the following:

- Grid middleware specification in terms of open APIs
- Open Source Grid middleware implementation. Note that the overall Grid4All platform is modular and consists of several subsystems which can be used and exploited independently from one another, e.g the market-based resource management system or the Virtual-Organization-Aware file system.

4.1.1 IPR issues

The Grid4All Consortium Agreement [2] has settled major IPR issues between members. Most Grid middleware components developed as foreground software in the course of the project will be made available and supported as open-source. The exact nature of the open-source license (GPL, LGPL, BSD) has yet to be determined. Licenses that will be used will depend on the software's specific functionalities, as well as on their intended exploitation. Licenses that will be more specifically used include BSD, LGPL and Mozilla. We expect the use of these licenses will greatly enhance the chances of industrial pick-up outside the consortium as this license makes it possible for industries to keep part of their product's software proprietary, while still being able to guarantee interoperability with competitors products by using open source components for the middleware and standard services. The GPL license has an important drawback for industrial and academic use, as it forces all software linked to the GPL software to become open source software even when used in a commercial product. This would be an obstacle to use the Grid4All software in actual product development, but also for academic institutes working on algorithms, which they don't want to give out. This means the use of GPL licensed software components will not be integrated in the software developed in the project so as to avoid contamination of the middleware software components developed within the project.

- Usage of background software by the consortium in the development of Grid4All middleware and applications.
  - o To avoid duplication of efforts and in the interests of standardization, the endeavour whenever feasible, to base its deliverables on existing open-source works, especially ones developed by the European projects and those provided by the partners within the consortium.

- o The consortium will avoid such software that is protected by the GPL licence, since that would oblige it to disclose all Grid4All source whenever Grid4All software is offered for external use (whether free or not).
  - o This guideline will be relaxed in the case of applications executing over the middleware developed within Grid4All thus allowing the consortium to use GPL based external application software.
- Production of software by the consortium:
  - o By default, any software fore ground produced by the consortium will be protected by a non-restrictive Open Source Licensing, either BSD or LGPL. This open-source strategy does not preclude industrial partners such as France Telecom or Antares from seeking a competitive advantage in specialized Grid components, e.g. with regard to accounting, payment, SLA provision or at the application level.
  - o In all cases, the consortium agreement enforces non-discriminatory exploitation of any of its results by its members.

It is worth stressing that the adoption of an open-source approach by the Grid4All project is a key factor toward the democratization of the Grid. Grid4All aims at establishing and animating an active community of developers who will maintain and evolve the Grid4All platform beyond the end of the project.

The exploitation of the open-source software produced by Grid4All will be carried out by non-for-profit organizations that promote and support open-source middleware, a prime candidate being the ObjectWeb consortium (whose membership includes France Telecom and INRIA).

## 4.1.2 Planned standardization activities

Monitoring and influencing relevant standards is a key objective of Grid4All. Standardization is important to encourage industrial acceptance of middleware and service platforms, therefore the Grid4All consortium will contribute to the standardization efforts of the Open Grid Forum and other standardization bodies by supporting the development and/or enhancement of Grid-related standards. Reciprocally, the project will remain aware of standardization work directions and trends. The consortium will leverage the experience and influence of its partners who already contribute and lead standardization efforts within different bodies: ETSI, IETF, IRTF, OGF, W3C (INRIA, FT); IEEE Learning Technologies (UPRC)

Analysis of our contribution towards standardization efforts will start at the end of the first year of the project. So far we have identified the IETR technical working group on peer-to-peer technologies, and also relevant working groups of the OGF (Data, Architecture, and Management). Grid4All consortium will also participate in joint cross-project efforts on standardization where appropriate within the scope of this task.

In particular, the Grid4All project intends to contribute to standardization activities on: 1) Business Process Execution Language for Web Services (BPEL4WS) that is used to integrate multiple services together to work in conjunction according to some prescribed order; 2) Web Services Invocation Framework (WSIF) that is used to dynamically generate service proxies that, for example, can be implemented in the language of the client application.

4.1.3 Market model

The following diagram attempts to sketch the market model underpinning Grid4All by identifying the main actors and their interaction with one another.
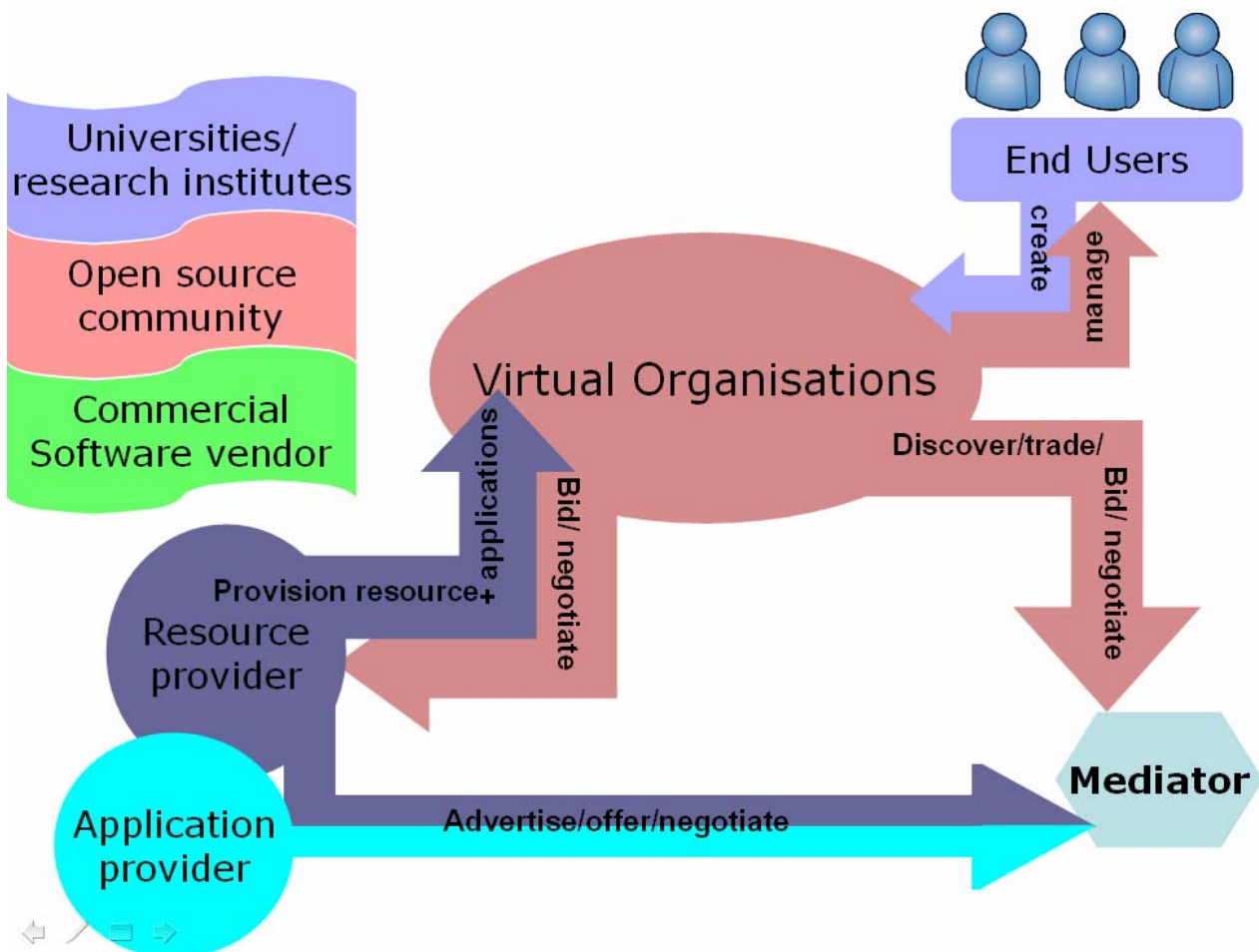
The key players and stakeholders are as follows:

- End users including residential users, small institutions (e.g. schools) and SMEs. Such categories of end users should be able to access Grid resources and services as transparently as possible with a minimal level of technical expertise required.

- Virtual organizations regroup end users and their associated resources across multiple administrative boundaries. A Virtual Organization as a logical entity interacts with other actors in order to manage itself (e.g. addition of external resources to the VO negotiated and obtained through market-based mechanisms)

- Resource providers and Application/Service Providers supply resources (CPU, storage) and grid-based service (e.g. digital media processing) to Virtual Organizations. These providers can operate on a commercial or non-for-profit basis.

- Market Mediators offer market intermediation services between consumer and providers of resources: information service, marker trading/brokering services, resource aggregation/bundling service, ranking service assigning reputation values to resource/service providers etc..

- Academic institutions (universities, research institutes) will play a key role in creating and animating an open-source Grid middleware community of users and developers.

- Commercial software vendors will take advantage of Grid4All services and open APIs to build commercial applications and tools. They can also make a profit by providing consulting services.

It is worth stressing that Grid4All allows the use and inter-operation of non-for-profit resources/services along with profit-based resources/services. End users will typically act as resource providers as well. As an example, the pool of resources accessed by a Virtual Organization can be provided internally by the members on a non-for-profit collaborative basis and be complemented by external resources sold by

commercial resource providers on a computational market. Such an Internet-wide market-oriented Grid allows multiple types of dynamic business relationships between entities:

- Business-to-consumer, e.g. when end-users (through the virtual organization they belong to) buy resource from commercial providers
- Business-to-Business, e.g. two SMEs pooling their resources together
- Consumer-to-Consumer, e.g. where end users access and share each other resource within or across virtual organizations.

Grid4All members' roles with regard to this market model:

- Universities and research institutes (SICS, KTH, INRIA, ICCS, UPC) will foster the adoption of the open-source Grid4All middleware through dissemination and animation activities.
- Antares, as a commercial software company, will identify commercial software offerings (applications, tools) based on the Grid4All technology with a particular focus on group communication applications and the education sector.
- France Telecom as a telecommunication operator can fit several roles: commercial resource/service provider (for its own services or for third-party services), market mediator.

The following section details the individual use plan of each Grid4All partner.

4.2 Individual partner strategies

4.2.1 France Telecom

France Telecom is one of the world's leading telecommunications operator. France Telecom, through its new Orange worldwide brand, provides businesses, consumers and other carriers with a complete portfolio of solutions that spans local, long-distance and international telephony, wireless, Internet, multimedia, data, broadcast and cable TV services.

The R&D division of France Telecom has initiated research activities investigating large-scale distributed computing models like Grid and P2P and their relevance from a telco operator viewpoint. France Telecom views Grid/P2P technologies as (i) means to rationalize and reduce the costs of its internal IT infrastructure and (ii) as enabling technologies for new value-added services targeting either residential users or corporate users. Grid4All is relevant to both objectives. Regarding the former objective, France Telecom R&D is pursuing research on Grid technology as a mean to break up the vertical silo organization of its service infrastructure. Key requirements are the support of real-time applications (in particular Voice or Video over IP), on-demand allocation of resources and self management.

Regarding new telco services, the Grid4All "community grid" model targeting residential users, schools and SMEs will be fostered by ongoing technological evolutions of the Internet that France Telecom is supporting:

- the progressive introduction of very high bandwidth Internet access (Fiber To The Home) for residential users
- the key role played by high-speed modems that act as home gateways to a variety of equipment (TV set-top box, domotic appliances, personal computers, PDAs…). These gateways are getting more powerful in terms of CPU and storage capacities and can host services components dynamically downloaded and upgraded through the network.
- the convergence of fixed, mobile and multimedia services
- the Web2.0 technologies enabling rich internet applications and community-oriented interactions between end-users

Today, France Telecom already acts as a resource provider for residential users for specific services, e.g. online storage of multimedia content such as photos, videos or music files, online backup services for home PCs. Grid4All is an opportunity for France Telecom to explore further business models where it could play the role of an Application Service Provider and/or of a market mediator providing ranking, online payment and matchmaking services.

From an organization point of view, France Telecom R&D division plans to exploit the results of the Grid4All project by establishing close relationships with several of its business units though its technocenter that

brings together skills in marketing, research and development. This technocenter has been operational since early 2006. Throughout the course of the project, several internal workshops will be organized in which Grid4All France Telecom members will have the opportunity to demonstrate proof-of-concept prototypes to the business branches of the operator.

As far as standardization is concerned, it is worth noting that France Telecom is the co-chair of the Telecommunication Community within the Open Grid Forum and as such will explore to what extent relevant results of Grid4All can be provided to the OGF.

4.2.2 INRIA

Over the years, INRIA has refined its strategy for exploiting joint project results. This strategy is based on the participation in standardization committees, the dissemination of visible prototypes in open source software and high quality research publications. In particular, INRIA is an active member of the ObjectWeb consortium that develops OSS middlewares and tools.The four teams involved in Grid4All follow this general strategy.

Atlas has been developping the Atlas P2P Architecture prototype using the JXTA (OSS in Java from Sun) framework. APPA is a new P2P data management system and Grid4All allows us to improve it and validate it in the context of dynamic Grid environments. We plan to deliver APPA as an OSS prototype through ObjectWeb.

GrandLarge has been developping the XtremWeb opensource middleware for Desktop Grid Computing. Scheduling heuristics designed for the Grid4all project will be integrated within the XtremWeb framework. We also plan to experiment with these heuristics on Grid5000.

Regal is currently developing an optimistic replication middleware based on the Action-Constraint Framework. Named Telex, this middleware is freely available (in source form) on SourceForge. It is written in Java. Ideas developed within the Grid4All project will be integrated into Telex. Ultimately INRIA Regal also plans to include some demonstrative applications and some developer tools. INRIA Regal will propose the use of Telex to its other co-operative projects.

Sardes is currently developing a component-based framework for constructing automated management functions for large distributed systems, including component deployment, dynamic configuration management, and self- repair. A first version of this system, called Jade, is being prepared for release in December 2006 under an open source license through the ObjectWeb consortium, as an integral part of the Jasmine ObjectWeb project. The future versions of Jade, including support for Virtual Organization management, developed aspart of Grid4All, will continue to be delivered under an open source licence through the ObjectWeb consortium.

The scientific results of INRIA's research in Grid4All will be submitted to international conferences or journals in the areas of distributed computing (for instance Middleware), distributed algorithms (e.g. PODC, DISC or OPODIS), computer systems (Usenix, OSDI or SOSP), data management (e.g. SIGMOD, VLDB, Coopis, etc.), software engineering (e.g. CBSE, ICSE) and high-performance computing (SC, CCGRID, IPDPS, ICS or GRID),. Early results that are not sufficiently mature for submission will be presented in workshops (PCGRID, GP2PC, HotP2P) and published as INRIA technical reports.

4.2.3 SICS

The SICS general strategy for dissemination of project results is threefold. First, we work to publish our results in high-quality scientific journals, conferences, and workshops. Secondly, we make available some of our research systems as open source software of reasonable quality and produce the necessary documentation to enable users to both understand and to make practical use of system. Thirdly, we try to disseminate relevant research to Swedish industry and in particular the sponsor companies of SICS (Ericsson, Telia, ABB, Saab, FMV, Green Cargo, Bombardier). This is achieved by 1) cooperatively monitoring the needs, requirements and perceived difficulties as experience by Swedish Industry, and 2) matching recent research results to these needs. Often, but not all the time, the relevance and importance is uncertain, in which case we strive to formulate projects to clarify such uncertainties, for instance, by building/adapting prototypes for the specific need of our industrial partners.

The scientific results obtained by SICS in the Grid4All project will be submitted to suitable international conferences/journals/workshop. In particular we except some results in the following areas, distributed computing, middleware, distributed algorithms, computer systems, software engineering, and peer-to-peer.

SICS and KTH have developed a DHT-overlay called DKS. This is already available as open source (http://dks.sics.se) and is continually being developed and improved. In this project we plan to extend DKS to provide a generic infrastructure as a base component of a number of important management services. We plan to make this extension open-source as well.

Furthermore in our vision we will also develop a number of important management services (co-designed by SICS/KTH/INRIA) that will also be included under the open-source umbrella. It is hoped that the management services will also exemplify principles (that we will formulate and document) involved in the construction of distributed services using DKS-based overlays (or other overlays) as the central coordination component.

We will (continue to) disseminate our results in other forums such as the CoreGrid NoE, and in the various collaborations with other IST projects not only to promote Grid4All achievement but with a view to consolidation with other cutting edge technologies to maximize impact.

4.2.4 KTH

In the Grid4All project, KTH is mostly involved in research, development and prove-of-concept implementation of self-organizing overlay Grid services, a component-based programming model with self-* properties, and Grid4All data storage, e.g. VO-aware file system and semantic store. KTH brings to the project an expertise in P2P computing, in development of Grid-enabled scalable Grid services using P2P approach. The KTH research group participating in Grid4All has established broad industrial and academic contacts that can be used as points of contacts for dissemination and exploitation of Grid4All results, including developed software, in both industry and scientific communities.

As the major idea of the Grid4All project is democratization of the Grid, KTH and other partners expect that the Grid4All results will be attractive not only to the traditional community of Grid users, but also to the community of domestic users, families, non-profit organizations such as schools, and small enterprises, which are considered to be major potential users of Grid4All results. In order to attract attention of this category of potential users to the Grid and, in particular, to Grid4All solutions, the project participants have to establish contacts with schools, present and demonstrate project results including demo applications. KTH intends to contribute to efforts of Grid4All in dissemination of projects results in the community of ordinary residential users, and in actions towards exploitation of Grid4All results in this community.

The strategy of KTH in disseminating Grid4All results is based on the following dissemination actions and mechanisms.

- Participations in workshops, conferences, exhibitions, press conferences and meetings with the presentations of research results and demos, including
  - o Presentations of research results and demonstration of developed software at national and international forums (workshops, conferences, and symposiums) related to the areas of Grid, P2P and distributed computing; on meetings with industrial companies, research groups of universities, teachers, students and IT personal of schools;
  - o Presentation and demonstration of Grid4All results on meetings with potential users from scientific and industry communities as well as from the community of domestic user and non-profit organization, e.g. in schools;
  - o Organisation of joint dissemination activities, e.g. workshops, with other Grid related projects;
- Publishing projects results in technical reports, technical papers in proceedings of relevant conferences, workshops and symposiums, as well as in journals;
- Publishing project results on the web, newspapers, press releases, journal and magazines.

The Grid4All project aims at building "democratic" Grid that is a collaborative self-* Grid infrastructure for dynamic VOs in dynamic Grids formed of resources provided and consumed by domestic users, non-profit organizations such as schools, families, and small enterprises, i.e. IT-inexperienced users.

KTH expects that exploitable results will include knowledge, skills and expertise in building self-* Grid infrastructure using P2P approaches, as well as developed software, e.g. self-managing P2P overlay infrastructure, VO-aware file system (VOFS). During the project, KTH expects also to obtain more knowledge and expertise in self-management mechanisms of large-scale distributed systems, e.g. Grids.

The strategy of KTH in using the expected exploitable results will be based on the following actions:

- Offering Grid4All solutions, e.g. a middleware for building scalable self-organizing Grid (overlay) services that span multiple administrative domains, VOFS, to potential users in scientific, industrial and residential users' communities;
- Offering expertise in building self-* Grid infrastructure and applications;
- Offering and provisioning training courses and consultant services, based on obtained knowledge and expertise, to students at KTH and other universities, software developers in industry, potential users of Grid4All solutions and software.

4.2.5 ICCS

The participation of ICCS to the Grid4All project will enable the CSLab's Parallel and Distributed Systems Group undertakes several activities in the fields of distributed systems and especially VO-aware storage facilities. ICCS envisages to exploit the project results in providing consulting and technical support on large scale distributed storage and data management within the Greek industrial and government sector;

The exploitation will be performed on the following mechanism:

- provision of technical consulting to Greek industrial links, in the view to propose the adoption of VO-aware storage platforms to innovative demanding applications;
- direct offer of expertise in developing and using VO-aware storage infrastructure and data management systems to market;
- provision of consultant activity and training courses for suppliers and users.

The main items for dissemination will include:

- technical reports about data management and storage systems SW & HW architectures;
- technical notes on data management and distributed storage testing problems;

The dissemination of these results will take place through publications, presentations at conferences, seminars for professional engineers and specialists and exhibitions. Publications will be diffused through technical journals, conference proceedings, trade magazines and on a WEB page on the Internet.

In particular, dissemination of the aforementioned results is expected to be included in publications in conferences concerning GRID and P2P computing.

4.2.6 UPRC

The University of Piraeus Research Center (UPRC) has as its primary purpose to meet the needs of enterprises and organizations of the private and public sector on subjects concerning designing, programming and effective control of net-centric systems with the aim of improving their efficiency and development. Within the frame of this purpose the UPRC is busily occupied with general and applied research as well as training, by using modern means and methods.

In this project, the UPRC will be represented by its faculty members and research group who are affiliated to the Department of Technology Education and Digital Systems. UPRC main contribution to the Grid4All project is through technical work in WP2 (Virtual Organizations and Resource Management) and WP4 (Applications and scenarios):

UPRC has expertise in software architectures of net-centric applications, as well as the design and development of e-learning environments.

The exploitation will be performed mainly via:

- Offering expertise to determine scenarios and derive requirements for infrastructure and applications specific for the Grid4All intended uses. In addition we will develop prototypes of new demonstrator applications for the Grid4All application environment

- Offering expertise in designing and implementing a semantically information system relying on ontological models for the definition of Grid resources and services

The dissemination will be based on:

- Technical reports and publications on conferences and journals related to the topics of "Applications and Scenarios" and "Virtual Organizations and Resource Management"
- Publication of software elements and tools on the web.

4.2.7 UPC

UPC participation in this project will complement the work done in the last years on decentralized markets mechanisms for resource allocation in peer-to-peer and Grid systems, and on collaborative work and learning applications based on Grid and peer-to-peer middleware. This work is an opportunity to complement but also disseminate in other ongoing research activities such as COREGRID (participation in a European-wide roadmap based on the activities of the CoreGRID NoE), SORMA (economically enhanced architectures), the national project SALDIS (on the convergence between Grid and P2P), and the national network of excellence on "Grid Middleware" (an opportunity for disseminating results).

The exploitation will be performed mainly via:

- offering expertise in developing Grid4All based applications and economically enhanced grid and P2P computing to partners and industrial links.
- courses at the masters and doctoral level on topics and results related to the project.

The dissemination will be based on:

- Technical reports and publications on conferences and journals related to the topics of Applications, and economically enhanced grid and peer-to-peer computing.
- Technical talks, presentations, publications at national and international Grid forums
- Publication of software elements and tools on the web (project web page and research group web page).

4.2.8 ANTARES

Antares (www.antares.es) is a company specialized in the development of communication and training solutions. We cover from the contents creation with regards to our client's needs to the content adaptation supplied by the client itself to convert them in communication or learning objects. In the same way, our own developed applications and our own multimedia equipment allow us to apply the most suitable treatment to each project.

Among our clients can be found, small, medium or large companies as Gas Natural, Planeta deAgostini, or Volkswagen Audi Spain, or institutions as FIFA, RENFE, or the Spanish Ministry of Education.

The kind of project that the company affords is varied, from simple projects, though often using state of the art technologies, to huge or multinational ones.

In the field we are developing our activity, and taking into account the increasing bandwidth available to our potential market, *Online Live Collaborative Sessions* will be demanded. In other words, synchronous collaboration support tools for potentially widespread participants with a potentially high and rich degree of interaction.

Then, collaborative tools as the ones described in the scenarios of Grid4All (residential users, schools, SME, other organizations), which could be run in a middleware environment as Grid4All could be very appreciated.

- Corporative solutions:
  for live collaborative meetings in a multinational or highly dispersed delegations environment
- Learning solutions:
  for small market niches spread in a wide national territory that need tutorized on line live sessions
- Home solutions:

For social collaborative networks with members that need talking and seeing each other at certain dates

The exploitation of experience and results from Grid4All will be addressed in three aspects:

1. New and improved services and applications for our customers: the development and adaptation to the Grid4All environment and requirements will create the basis for new functionality and new services that can be used as a demonstrators for our current or potential customers to promote that the results of the project could be translated in an advancement of functionality to our customers, which cover most of the user profiles envisaged in Grid4All.

2. Improvement on internal processes:

   2.1. Reduction of operational cost, development costs and thus an increase of efficiency in the development and deployment of applications and services

   2.2. Optimization of the development and exploitation department via direct use of the experience gained through the project and via the use of software tools and services to develop our products.

3. New markets:

   3.1. In terms of activity sectors: the potential of the Grid4All results opens opportunities to offer applications for new customers.

   3.2. In terms of geographic scope: the geographic coverage of the consortium and the expected dissemination activities brings visibility and opens opportunities for wider audiences, specially at the EU level or internationally.

   3.3. In terms of collaborations: the potential collaboration with the partners within the project and particularly with industrial partners can open the opportunity to consider markets that require a combination of infrastructure, services and applications, directed to a more open audience as with residential users or industrial sectors, etc.

In particular, the increasing use of low cost terminals creates an opportunity for developing new product offerings to many existing or new customer's based on the ideas of Grid4All.

At this point of development it is difficult to tell which other commercial uses will be found upon this project.

4.3 Exploitable knowledge and its use, overview table:

To be filled all along the project life.

Exploitable knowledge	Exploitable product	Sector(s) of application	Timetable for commercial use	Patents or other IPR protection	Owner & other partners involved

5. References

[1] Grid4All deliverable D8.1 "Collaboration Plan"
[2] Grid4All Consortium Agreement