Proposal/Contract: 031874

CYCLOPS

CYber-Infrastructure for CiviL protection Operative ProcedureS

D19
Final Plan for Using and Disseminating Knowledge

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	António Pina		
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0.1	01/10/2008	Initial document based on D4	Vítor Oliveira	UMINHO
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0.5	18/11/2008	First draft for revision	Vítor Oliveira	UMINHO
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0.7	19/11/2008	Comments and revision	António Pina	UMINHO
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0.9		Review	Project Review Board	All

D I S T R I B U T I O N   L I S T

PARTNERS:

DPC	INFN	IMAA	DDSC	CP-CH	TEI-CR	ANPC	EMA	UMINHO

EXTERNAL EXPERTS:

OTHER:

CYCLOPS WEB SITE	http://www.cyclops-project.eu				

T A B L E   O F   C O N T E N T S

EXECUTIVE SUMMARY

This document presents the Final Plan for Using and Disseminating Knowledge acquired throughout the development of the CYCLOPS project as deliverable D19. It includes a description of the main achievements in disseminating knowledge, and the consortium and each participant's plans for the exploitation of the results for the consortium as a whole, or for individual participants or groups of participants. It updates the Plan for Using and Disseminating Knowledge that was presented as Deliverable D4 and describes the final dissemination plan of the CYCLOPS project.

This deliverable provides a strategy aimed at addressing various target communities in order to achieve the project dissemination and exploitation goals. After an update of the dissemination instruments employed, the deliverable focuses on the description of the dissemination activities carried out.

In addition to the normal dissemination and exploitation of the work through scientific journals and professional bodies, Civil Protection Community will be specifically targeted for dissemination of the CYCLOPS deliverables, and their future exploitation of the results.

Other written deliverables focus on presenting dissemination activities in specific subject areas. In particular deliverable D17 reports "the results of the dissemination of EGEE towards the Civil Protection community, and about the coordination between the EGEE and CYCLOPS activities", deliverable D18 focuses on "collecting the CYCLOPS project results for dissemination towards different interested audiences such as Grid communities, other Civil protection agencies, but also national and international initiative and projects, SMEs, etc." and deliverable D20 that reports "the extent to which actors beyond the research community have been involved to help spread awareness and to explore the wider societal implications of the proposed work.

1   INTRODUCTION

CYber-Infrastructure for CiviL protection Operative ProcedureS (CYCLOPS) is a FP6 supported research project that intends to bring the Grid and the Civil Protection communities closer together, making CP communities aware of the services provided by Grid infrastructures, and, at the same time, making Grid researchers aware of Civil Protection specific requirements and service enhancement needs. As it is essential for CP applications, GMES (now Kopernikus) geospatial information and considerations are also included [1].

The project also brings together different communities in the CYCLOPS Consortium structure, that includes both research institutions – Istituto Nazionale di Fisica Nucleare (INFN), Istituto di Metodologie per l'Analisi Ambientale (IMAA), Ecole des Mines d'Alès (EMA), Technological Educational Institute of Crete (TEI-CR), Universidade do Minho (UM) – and civil protection agencies - Dipartimento della Protezione Civile (DPC), Direction de la Défense et de la Sécurité Civiles (DDSC), Civil Protection of Chania Prefecture (CP-CH), Autoridade Nacional para a Protecção Civil (ANPC) – from several countries – Italy, France, Greece and Portugal.

The Grid paradigm represents a technological and economic revolution in high performance distributed computing, particularly in that which concerns information access and the availability of computational power. Grid based platforms allow the implementation of widely distributed computing environments operated as a uniform service, such as the environment offered by the Enabling Grids for E-Science in Europe (EGEE) project [2], approved by the European Commission in 2003.

The EGEE project constitutes the world's largest international multi-disciplinary grid infrastructure to deliver a reliable and scalable computing resource to the European and global research community. It is a significant technical achievement for European society that has been leveraged by important and strategic sectors. The EGEE project initially focused on two application areas; High Energy Physics and Biomedical, which served as pilots and also as milestones for the development of the various EGEE Grid services. The EGEE now constitutes the world's largest international multi-disciplinary grid infrastructure and brings together more than 120 organisations to deliver a reliable and scalable computing resource to the European and global research community. It expanded over time to support applications from many other scientific domains, such as Astrophysics, Computational Chemistry, Earth Sciences, Finance, Fusion, Geophysics, Drug Discovery, Hydrology and Cosmology. Ultimately, it is aimed at the integration of current national, regional and thematic Grid efforts, in order to create a sustainable European-wide grid infrastructure (EGI) [3].

CYCLOPS is an EGEE-collaborating project, and intends to contribute to EU policy developments by establishing liaisons and synergies with other existing projects and initiatives dealing with GMES, GRID and complementary sectors, among them INSPIRE, e-IRG, Risk-EOS, PREVIEW, RISK-AWARE, BOSS4GMES, EGEE Networking Activities and Application Support.

EGEE infrastructure constitutes a natural candidate to support the most demanding requirements of the applications from the European CP community. This effective synergy will guide the development of future Grid research infrastructures and study the feasibility of them running on the European Grid Infrastructure. The creation and operation of a Grid infrastructure for Civil Protection applications can affect Civil Protection information infrastructure design and operation, so it is important to address the definition of innovating strategies for Civil Protection systems porting in order to prepare for the adoption of Grid-based platforms.

1.1   MOTIVATION

During the last decades there has been a trend towards an increase in the number and cost of natural catastrophes and man-made disasters, as statistics confirm [4][5]. Natural catastrophes related to storms and flooding have increased the most, which is of major relevance in Europe, and property losses related to
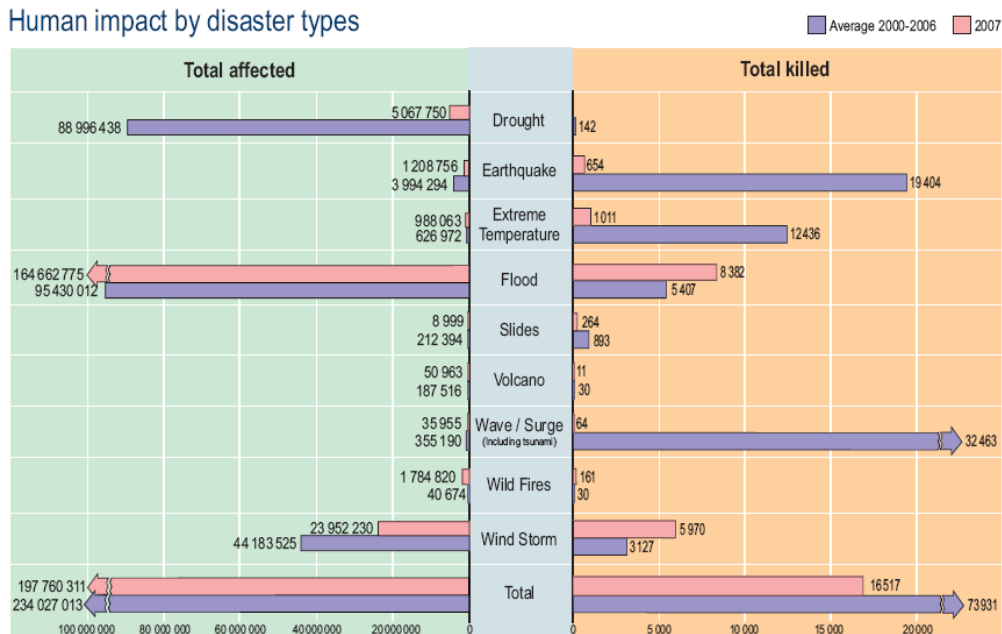
flooding have increased an estimated 7% each year since 1970. Earthquakes, sometimes followed by tsunamis, storms, floods and heat waves are among the most lethal events and in 2007, a below the trend year, 14,600 people died as a result of 142 natural catastrophes, 12,500 of which were from storms and floods. There is also a significant increase in the number of victims of man-made disasters with 193 events taking 6,900 lives. Forest fires, which are a mixed natural and man-made disaster, have also increased in number and, although the number of victims is not large, they are specially damaging in southern European countries such as Portugal and Italy.

The pictures that follow (from [4]) represent the observed increasing trend in the number of disasters, along with a distribution of deaths by region and the distribution of all victims by disaster type. It is especially meaningful that Europe accounts for 15% of the deaths by natural disasters that occurred between 2000 and 2006.
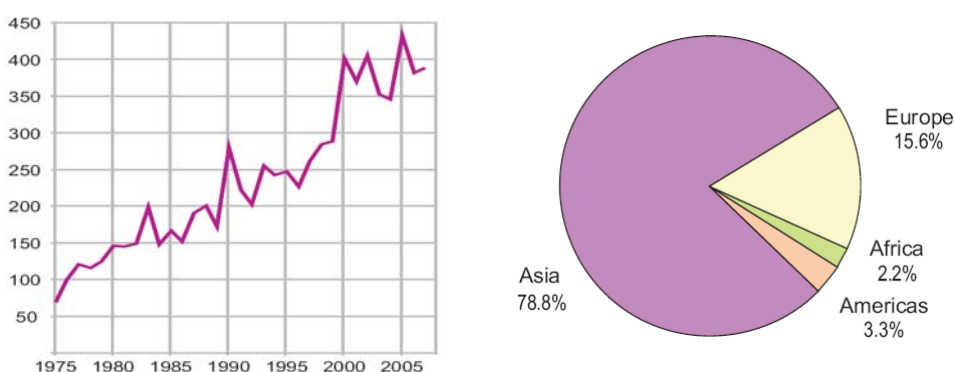
Picture 1 Natural disasters occurrence trend and percentage of deaths by region 2000/2006 [4].

Picture 2 Human impact by disaster type [4].

Although one can actually believe that *world history exhibits nothing other than the plan of providence* [6], according to the United Nations Development Programme [7] human technological development is exacting a significant price in the form of climate change. We are imposing stress on the environment, as the world population has risen from 1.6 billion people at the beginning of the twentieth century to over 6 billion people

in the year 2000, and is expected to grow to 9 billion people by 2050 [8]. The total implications of such a massive change are yet to be identified, but understanding how this can affect us and the environment, and how to cope effectively with the consequences, is of the utmost importance.

Civil Protection (CP) plays an especially important role in this state of affairs, providing an activity directed towards the development of structures ensuring the protection of, and assistance to, populations and safeguarding property and the environment. As CP concerns us all, we believe that providing the tools that CP requires to perform adequately must also be considered a major goal for the scientific research community. In particular, providing cooperative efforts to survey, forecast, evaluate and prevent collective risks; to study protection measures; to research new equipment and technologies for search and rescue operations and for population assistance; and to study adequate natural resource protection measures.

CP is a complex area where finding suitable compromises in order to efficiently manage any kind of disaster with the limited resources available can greatly benefit from systems that amplify human intelligence. Some of the systems developed by Civil Protection agencies increasingly demand access to dependable and high performance computing services and infrastructures in order to face the most demanding events.

Porting Civil Protection applications to a Grid computing infrastructure requires support for specific requirements of these applications, such as real-time support, spatial data infrastructures, security and data policies, sensor networks and acquisition systems control and knowledge-based Grid services. These requirements have strong impact on research strategies (new data models, algorithms, and methodologies need to be investigated) and consequently on the functional and non-functional requirements of the enabling research infrastructures (new protocols, services and architectures need to be designed and implemented). It is important to address the definition of innovating strategies for Civil Protection systems porting in order to prepare the adoption of Grid-based platforms.

When designing information systems for CP applications, it is important to highlight that CP applications may be the last point of protection in the case of major incidents. Multiple system redundancy must be provided, not only for regular backup, but principally because, in the presence of an event that damages the regular functioning of the systems, there is a high probability of that event coinciding with when the system is needed the most. As an example, after an earthquake it is likely that a large number of victims may need to be treated in a hospital where damage to the essential technical infrastructures may have occurred.

1.2   PURPOSE OF THIS DOCUMENT

This document presents the Final Plan for Using and Disseminating Knowledge acquired throughout the development of the CYCLOPS project. It includes a description of the main achievements in disseminating knowledge, and the consortium and each participant's plans for the exploitation of the results, for the consortium as a whole, or for individual participants or groups of participants. The basis for this deliverable was the Plan for Using and Disseminating Knowledge that was presented as deliverable D4 of the CYCLOPS project. This document presents a final dissemination plan aimed at increasing awareness of the CYCLOPS project by both the research and application communities. It also reports the participants' actual achievements in dissemination and their plans at this time for the exploitation of their results.

1.3   AUDIENCE

The document is a CYCLOPS deliverable related to the work package WP5 – Dissemination and Exploitation, targeted at all people who are involved in the project, such as Partners and Third Parties staff members, project contributors and users. It also addresses the European Commission and any actor which may be interested in the project, e.g. related projects, governments and funding bodies, potential sponsors, institutions or research groups interested in joining the user base.

1.4　DOCUMENT ORGANISATION

Following this introductory section the remainder of this document is divided into three other sections. Section 2 presents an overview of the dissemination plan that was established for the Cyclops project in deliverable D4. Section 3 highlights the main dissemination activities that were carried out for the Cyclops project. Section 4 will then present the plans for the exploitation of knowledge by the partners involved.

1.5　DOCUMENT AMENDMENT PROCEDURE

Requests to amend this document must be sent firstly to the main editor, Vítor Oliveira (vspo@di.uminho.pt).

1.6　TERMINOLOGY

ANPC	Autoridade Nacional para a Protecção Civil
CP	Civil Protection
CP-CH	Civil Protection of Chania Prefecture
CYCLOPS	Cyber-infrastructure for CiviL protection Operative Procedures
DDSC	Direction de la Défense et de la Sécurité Civiles
DPC	Dipartimento della Protezione Civile
EGEE	Enabling Grid in E-sciencE
EGEE	Enabling Grids for E-Science in Europe
EGI	European wide grid infrastructure
e-IRG	e-Infrastructure Reflection Group
EMA	Ecole des Mines d'Alès
ES	Earth Science
GMES	Global Monitoring for Environment and Security
IMAA	Istituto di Metodologie per l'Analisi Ambientale
INFN	Istituto Nazionale di Fisica Nucleare
INSPIRE	Infrastructure for Spatial Information in Europe
KOPERNIKUS	The new name for GMES since it entered its pre-operational phase in Sep 08
PREVIEW	Prevention Information and Early Warning
TA	Technical Annex
TEI-CR	Technological Educational Institute of Crete
UMINHO	Universidade do Minho
WP	Work Package

1.7 REFERENCES

[1]   "CYCLOPS Technical Annex", CYCLOPS Consortium, 2006.

[2]   F. Gagliardi et al., "Building an Infrastructure for Scientific Grid Computing: Status and Goals of the EGEE Project," *Philosophical Trans. Royal Soc. London A*, vol. 363, 2005.

[3]   "European Grid Initiative Design Study", description of work, 7th framework programme, [online] 2008. http://web.eu-egi.eu/fileadmin/public/documents/EGI_DS_DoW_v1.12.pdf

[4]   *2007 disasters in numbers*, Centre for Research on the Epidemiology of Disasters, United Nations/ International Strategy for Disaster Reduction (UN/ISDR), 2008.

[5]   Natural catastrophes and man-made disasters in 2007. Sigma, Swiss Reinsurance Company, Zurich, 2008.

[6]   Hegel, George Frederick. *Phenomenology of Spirit.* 1807.

[7]   Watkins, Kevin. *Human Development Report 2007/2008.* United Nations Development Programme, 2008.

[8]   *The World at Six Billion.* United Nation Population Division, 1999.

[9]   Cyclops in Greek Mythology, N. S. Gill, About.com
        http://ancienthistory.about.com/od/cgodsandgoddesses/g/Cyclops.htm

2   DISSEMINATION PLAN

CYCLOPS project success depends on the diffusion of its results to many different communities in order to foster future research and development activities aimed atthe design and implementation of the Grid infrastructure for GMES applications. The objective of this Dissemination Plan is to identify and organise the activities to be performed in order to promote the exploitation of the project's results and the widest dissemination of knowledge from the project. The present section describes the methods and materials used by the Consortium to disseminate CYCLOPS knowledge, goals, experience and benefits.

In Technical Annex [1] an overview of a dissemination strategy was provided, based on some specific actions that needed to be undertaken to successfully disseminate project results. In particular, the Consortium identified these key activities:

- Establishing close relationships with European Infrastructure projects such as EGEE and EGEE-2 and with Projects involved in the development of Grid infrastructures outside Europe (EELA, EUCHINAGRID, EUMEDGRID, etc.). A CYCLOPS contribution to the EGEE-II project conference and user forum will be assured.

- Monitoring and following up European and worldwide standards as they emerge within international bodies like the Global Grid Forum (GGF).

- Organization of and participation in conferences, workshops and knowledge dissemination events, so as to disseminate the project results to the potentially interested communities.

Based on these preliminary considerations a dissemination plan was carried out. The resulting CYCLOPS dissemination plan strategy is founded on the identification of four key elements:

- Goals: which are the operational objectives of the dissemination activity

- Source and Targets: who are the providers and the audience of dissemination activities (WHO should inform and WHO should be informed).

- Content: which is the information the Consortium should provide (WHAT should be disseminated).

- Media: which are the channels for dissemination (HOW the dissemination is performed).

- The identification of these strategic elements permits a detailed dissemination plan which defines the planned dissemination and exploitation activities (the WHEN and WHERE).

2.1   GOALS

Different goals are planned for the various stages of the project:

- In the initial phase (first six months), the dissemination activity will be mainly targeted at raising awareness of the existence of CYCLOPS Project, its activities and objectives;

- During the entire project duration, the dissemination activity will be targeted at presenting activities and preliminary or perspective results;

- In the final phase of the project (last six months), the dissemination activity will be mainly targeted at presenting the final results and preparing exploitation.

2.2   SOURCE AND TARGETS

Concerning the target audiences, the most important communities interested in CYCLOPS results are the Grid and the GMES communities. These communities have to be made aware of CYCLOPS activities and objectives as soon as possible since they are the possible initiator of future R&D projects. It is important to

stress that one of the objectives of the project, that is the porting of Grid technology to the GMES community, is a dissemination task in itself. Indeed, the entire WP for Coordination with EGEE is intended to establish a link between the Grid and GMES communities through the partners of CYCLOPS Project. The partners can disseminate the results to their communities. In particular INFN, that is a partner of EGEE Project, can disseminate CYCLOPS Project activities and results in the Grid community. Civil Protection (agencies??) can contribute to the dissemination in their countries through their national territorial organisation, and to their counterparts in other countries. Scientific partners can contribute by disseminating CYCLOPS results in the scientific communities through conference participation, and publications, mainly in the GMES, EO, environmental monitoring and remote sensing sectors.

All the partners will be responsible for dissemination activities depending on the target audience. In particular each partner will perform dissemination to its reference communities. Whenever possible the content of dissemination will be tailored to the different target users and communities.

2.2.1   Scientific Communities

GRID/ICT community

The GRID community will be mainly informed of the results concerning the impact and requirements of Civil Protection application on the enabling infrastructures.

GMES community

The GMES community will be mainly informed about the possibilities raised by the adoption of GRID technology. In particular the enhancement of existing scenarios and the enablement of new ones will be highlighted.

2.2.2   End users (joint activities with other user groups)

GMES/Civil Protection agencies

Civil Protection Agencies constitute the main user group. They will be the target of specific educational activities such as seminars, tutorials and workshops aimed to present the EGEE Grid platform. The content of seminars, tutorial and workshops will be tailored to the different profiles. Experts will be taught how to interact with Grid applications to become used to the Grid user experience, and also the exploration of Grid possibilities. Technicians will be taught how to manage, configure and possibly port CP applications on the Grid EGEE platform.

SMEs

Another important target of the dissemination activities are the SMEs. They are possibly interested in CYCLOPS results as an opportunity for being involved in R&D activities for new products and services in the market of environmental monitoring, remote sensing, security, etc. SMEs active in sectors such as automation (e.g. for acquisition systems control), electronics (e.g. for sensor web enablement), geomatics (e.g. GIS), software tools (e.g. decision support systems, expert systems) are all possible targets.

The SMEs will be mainly informed about possible industrial exploitation of CYCLOPS results and indications.

2.2.3   Standardization bodies

Standardization bodies constitute an important target of dissemination. Standards are the foundation for interoperability which is a core issue both for Grid technologies and for GMES applications. Standardization bodies will be informed of the achievements of CYCLOPS Project concerning the adoption of their specifications in the CYCLOPS relevant applications (e.g. geoinformation specifications application in a Grid context, Grid standards adoption for CP applications). Moreover CYCLOPS Project will provide inputs for enhancements of the specifications whenever needed.

The following standardization bodies/initiatives have already been contacted:

- Open Geospatial Consortium (OGC)
- INSPIRE Drafting Team Initiative

2.3 MEDIA

Dissemination activities will adopt different media to reach multiple targets. In particular:

- **Web Site**
  It is intended as the fundamental instrument for dissemination of the project to non-identified targets (pull-based dissemination). Through the web sites, persons and entities interested in GRID and GMES integration (will find)(will have access to??) general information, on-going activities and public deliverables. The web site will be reached through the use of search engines using related keywords (grid, gmes, civil protection, etc.) or through the URL reported in relevant publications (see other dissemination media).

- **Conferences**
  Through participation in the main conferences about Grid technologies, GMES and Civil Protection applications, etc. the CYCLOPS Project will be disseminated to specific communities. Conferences are considered highly useful in order to target dissemination at specific audiences and on specific topics.

- **Publications**
  Publications are another important medium for dissemination in specific directions. Publications in journals, magazines, newsletters, etc. allow different communities to be reached with different levels of detail.

Regarding the contribution to standard activities, the project will pursue collaboration with Pan- European efforts namely EGEE and EGEE-2. The specifications will be closely linked so as to achieve similar policy formats, service definitions, architecture, tools and so on. Moreover, WSRF and other Globus/GGF standards will be closely observed and fed back into. The relationship with EGEE and EGEE-2 will be of particular value in this context where these Projects will act as a strong link with international Grid efforts, including the Global Grid Forum (GGF). Again, active participation in quick requirements capture and fast feedback to the EGEE and EGEE-2 middleware developers will indirectly contribute to international standards.

Making the operational people aware of CYCLOPS and its future developments is essential, as they can relay information and disseminate such knowledge in their different work environments. Therefore, the generation of a module is envisaged for increasing awareness of the operational community, which could be released during the end users training sessions or included in the instructional material with the support of end user training authorities.
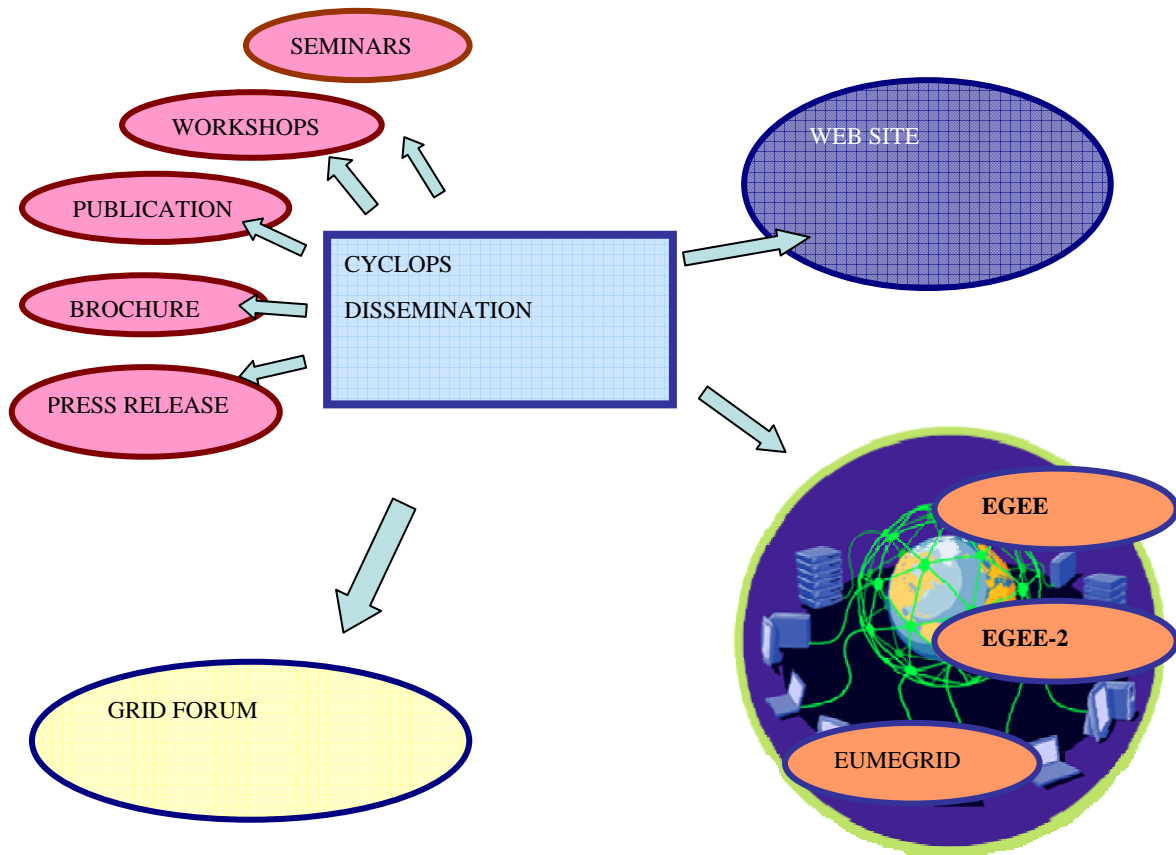
Figure 1: Dissemination media

2.4 METHODOLOGY

A project management website will be used to ensure constant, high quality information flow between the partners. This website will be the repository for all relevant documents, distribution lists and their archives, electronic bulletin boards, and meeting information. The website will be part of the overall project website for the dissemination activity, and managed with different security levels in order to interface persons with the basic tools.

The basic tools that will be put in place are the Management Database, e-Mail, Mailing lists, Templates for Meetings Agendas, Meeting Minutes, Reports and Costs statements. The project activities' meetings are also key tools for the running of the project. A calendar with the dates of ordinary meetings has been agreed ever since the kick-off meeting.

Specific actions will be undertaken to successfully disseminate project results. These include:

- ▪ Establishing close relationships with European Infrastructure projects such as EGEE and EGEE-2 and with Projects involved in the development of Grid infrastructures outside Europe (EELA, EUCHINAGRID, EUMEDGRID, etc.) A CYCLOPS contribution to the EGEE-II project conference and user forum will be assured

- ▪ Monitoring and following up European and worldwide standards as they emerge within international bodies like the Global Grid Forum (GGF).

Organisation of and participation in conferences, workshops and knowledge dissemination events, so as to disseminate the project results to the potentially interested communities. In particular the Cyclops partners plan the:

- Organization of a project open conference (in Italy, Roma – DPC) to be organized during the first year, to meet Grid, Civil Protection and GMES experts, broaden the opportunities for dialogue and discuss the EGEE platform for Civil Protection applications with other national and transnational organisations.

- Organization of a mid-term project workshop to present the analysis of civil protection structure and processes as well as to brainstorm on the research strategy definition activities on the basis of use-cases.

- Organization of a project final conference to present the results to many different communities: scientific and technological, Civil Protection, GMES and Earth Observation.

- Co-ordination of dissemination activities by project partners in the academic and research communities of the participating countries.

The Project will also facilitate the exchange of information between the participating countries and the rest of the world, via close interactions with worldwide Grid efforts and projects. This interaction between the associated participants of the project is envisaged to promote the integration of the research communities of the region to the ERA (European Research Area). In particular INFN will take the lead in the Organisation of two Training Workshops especially directed towards the Civil Protection community which will include theoretical lectures, debates and round table discussions, case studies and practical exercises, to focus on the proper knowledge and the skills needed to use the GRID computing infrastructures -place: Chania(Greece) and Padova or Bologna(Italy).

Regarding the contribution to standard activities, the project will pursue collaboration with Pan- European efforts namely EGEE and EGEE-2. The specifications will be closely linked so as to achieve similar policy formats, service definitions, architecture, tools and so on. Moreover, WSRF and other Globus/GGF standards will be closely observed and fed back into. The relationship with EGEE and EGEE-2 will be of particular value in this context where these Projects will act as a strong link with international Grid efforts, including the Global Grid Forum (GGF). Again, active participation in quick requirements capture and fast feedback to the EGEE and EGEE-2 middleware developers will indirectly contribute to international standards.

The project will spread and ease the technical expertise exchange between participating countries. Each partner selects the most important Conferences/Events in its own fields and send their experts to present the results of the work carried out within the CYCLOPS Project to port their specific application to the European Grid Infrastructure. These participations will be of importance for dissemination and cross-fertilization.

3 DISSEMINATION OF KNOWLEDGE

This deliverable provides a strategy aimed at addressing various target communities in order to achieve the project dissemination and exploitation goals. Following an update of the dissemination instruments employed, this deliverable will now focus on the description of the dissemination activities carried out.

As is to be expected from a Specific Support Action (SSA) project, the Dissemination and Exploitation activities are central and tightly linked to the technical aspects of the project. Work Package 5 is especially devoted to this dissemination of knowledge, though other packages include dissemination activities directed to specific audiences.

There are also other written deliverables that focus on presenting dissemination activities in specific subject areas. In particular, deliverable D17 reports on "the results of the dissemination of EGEE to the Civil Protection community, and the coordination between the EGEE and CYCLOPS activities", deliverable D18 focuses on "collecting the CYCLOPS project results for dissemination to different interested audiences such as Grid communities, other Civil protection agencies, but also national and international initiative and projects, SMEs, etc." and deliverable D20 that reports "the extent to which actors beyond the research community have been involved to help spread awareness and to explore the wider societal implications of the proposed work".

The dissemination of knowledge must make the existence of CYCLOPS project and its main results widely available to communities concerned with GRID and Civil Protection in Europe. The goal is to reach a large community and inform them about the CYCLOPS concept, making this audience aware of the potential benefits and to therefore build future development on an extended basis of users.

3.1 PROJECT LOGO

According to the Greek epic poet, Hesiod, the Cyclops were sons of Uranus (Sky) and Gaia (Earth), named Argos, Steropes, and Brontes. They gave Zeus the gift of thunder and lightning, since they were metal workers and blacksmiths. For the Greek epic poet, Homer, the Cyclops were the sons of Poseidon, one of the three brother gods (along with Zeus and Hades) who divided the world between them, with Poseidon's realm including the sea, water, horses, and earthquakes. [9]

Aside from the single eye, both authors present the Cyclops offspring of the Earth and the Sky as being of immense strength and size. The Logo of the project thus joins these mythical Cyclops with this multifaceted CYCLOPS project which addresses problems from the Civil Protection, Grid, and the Earth Science communities.

3.2 PROJECT WEB SITE

A web site was created for CYCLOPS at the beginning of the project and is available at http://www.ciclops-project.eu. This web site represents the first vehicle in raising awareness of the project and presents up to date information about the project, the results documentation and the on-going activities such as conferences, workshops or training sessions to the public .

At the time of writing the CYCLOPS Web Site has had over 100.000 hits since it was created.

Searching for "*gmes grid*" keywords on Google search engine presented 7 results related to CYCLOPS in the first 10 presented, including the project home page. Yahoo, on the other hand, returned 5 results related to CYCLOPS in the first 10 presented (erroneous suggestions from the engine such as "games" instead of "gmes" were excluded, e.g. with the option "-games").

The web page content is presented in an easy to use structure which follows this scheme:

Page header with Project logo and name		
Main Menu	Content: The home page presents the most recent event	Partners logos and links
Auxiliary menu		
Copyright and Statistics line		

The site is subdivided into the following main menu entries:

- HOME
- About Cyclops   Overview of the Project
  - DE
  - ES
  - FR
  - IT
  - PT
- Project   Project presentation
- Team   Partners
- Results Documentation   Public results and deliverables
- News   News about the project or related to it
- Events   Project events or other events of interest
- Links   Links to other relevant information
- Contact Us   How to contact the Consortium
- Guide Lines   Brief description of the Web Site
- Site Map   Map of the Web Site
- Personal Area   Partners' area with reserved access
  - Password Forget   Password recovery procedure

For dissemination purposes the sections "*About Cyclops*", "*Results Documentation*" and "*Project*" are the most relevant. The first one, which is the general presentation of the project targeted at the broadest audience, is published in six different languages (English, French, German, Italian, Portuguese and Spanish) chosen for diffusion or for being the language of CYCLOPS partners.

Fig. 2 - Home Page

Fig. 3 - Results Documentation Page

3.3   PROJECT DELIVERABLES

3.3.1   Work Package 1: Management

No	Deliverable name	Lead Partner
D1	Project Presentation This deliverable consists of a brief project presentation in English, written in a style which is accessible to the non-specialist. It is designed to be used both for WWW publishing and other media distribution, available at the project site for all partners to promote CYCLOPS during seminars and meetings.	DPC
D3	Perspective on cooperation with existing projects and initiatives This deliverable outlines how CYCLOPS relates (or plan to relate) to the main existing projects and initiatives in the contexts of Grid technologies, Civil Protection and GMES. It defines the actions required during the project extension to make these relationships effective and fruitful.	DPC

3.3.2   Work Package 2: Coordination with EGEE activities

No	Deliverable name	Lead Partner
D5	Training events plan This deliverable describes the scheduling (date, duration), organization issues (sites, equipments to be used), content and attendants' profiles for the planned training events.	INFN
D7	"EGEE cookbook: a guide for Civil Protection Grid users" This deliverable is a guide to the use of EGEE platform for Civil Protection users. It introduces the Grid technologies, their possible applications for Civil Protection, and describes EGEE platform. It will be prepared taking into account the target audience using a style accessible to non-specialists for the sections which are not addressed to technicians.	INFN
D10	First Training Workshop This deliverable consists of a workshop directed to the Civil Protection community which will include theoretical lectures, debates and round tables discussion, case studies, practical exercise, to focus the proper knowledge and the skills to use the GRID computing infrastructures. The material of the workshop will be made available through the project website.	INFN
D13	Second Training Workshop This deliverable consists of a workshop directed to the Civil Protection community. It is analogous in structure to the previous workshop but its content will be different according to the Training Events Plan. The material of the workshop will be made available through the project website.	INFN
D17	Dissemination and coordination activity final report This deliverable is a document reporting the results of the dissemination of EGEE towards the Civil protection community, and about the coordination between the EGEE and CYCLOPS activities.	INFN

3.3.3 Work Package 3: Civil Protection systems analysis

No	Deliverable name	Lead Partner
D6	Business Process analysis document This deliverable describes the Civil Protection agencies involved in the project. In particular it explains their responsibilities in the national context, the internal working model, the relationships with other national and international bodies, the organizational structure and so on.	ARMINES-LGEI
D8	Existing Analysis document This document describes the technical resources (both equipment such as computing, storage, communication, etc. and technical staff) available at each Civil Protection agency involved in the project, in the perspective of Grid technology adoption.	ARMINES-LGEI
D9	Use-cases document This document details a set of significant use-cases that could be ported, improved or even made possible by using Grid technologies. It is based on the Business Process analysis document and it is a fundamental input for the definition of the User Requirements.	ARMINES-LGEI
D11	System Requirements document This document describes the functional (what the system should do, i.e. data sharing, distributed processing, etc.) and non-functional (how the system should provide services, i.e. response time, throughput, etc.) requirements of a Grid-based infrastructure for enabling Civil Protection applications.	ARMINES-LGEI

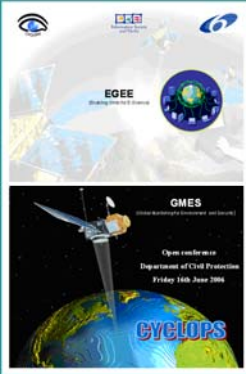### 3.3.4 Work Package 4: Research and Innovation strategies definition

No	Deliverable name	Lead Partner
D14	"EGEE Request for Enhancement" document This document details which enhancements would be required to EGEE platform to fully support Civil Protection applications. It is designed as a fundamental input for EGEE (and future EGEE-II) project evolution.	CNR-IMAA
D15	"Toward a Grid - Guidelines for Innovation Strategies for Civil Protection Systems" This deliverable describes how the planned adoption of Grid technologies can affect the innovation strategies of Civil Protection agencies. It is designed as an instrument for guiding future equipment acquisition, and technical staff enhancement in the view of Grid technology adoption.	CNR-IMAA
D16	"Research Strategies for the development of a Civil Protection E-Infrastructure" This document describes the research strategies to be followed for the design and implementation of a complete Civil Protection E-Infrastructure. It reports the results of the analysis and studies carried out by CYCLOPS project highlighting the open issues where more R&D activities are required to implement services and tools for Civil Protection applications on the top of a Grid-infrastructure.	CNR-IMAA

3.3.5 Work Package 5: Dissemination and Exploitation

No	Deliverable name	Lead Partner
D2	Project open conference This deliverable consists of a conference planned to meet Grid, Civil Protection and GMES experts broaden the opportunities for dialogue and discuss the EGEE platform for Civil Protection applications also towards other national and transnational organization.	ANPC
D4	Dissemination Plan The Dissemination Plan describes the actions to be taken for an effective dissemination of CYCLOPS during the entire project extension. It defines the scheduling of dissemination for each phase (raise of awareness, project activities dissemination, project results dissemination) taking into account a typical set of key factors (namely Users, Content, Source, Medium, Availability).	ANPC
D12	Mid-term project workshop This deliverable consists of a workshop planned to disseminate CYCLOPS activity and to collect useful comments for future direction of the project. For this conference an update of the CYCLOPS reference architecture will be available.	ANPC
D18	Project results presentation This document is a report collecting the CYCLOPS project results for dissemination towards different interested audience such as Grid communities, other Civil protection agencies, but also national and international initiative and projects, SMEs, etc. It includes training activities reporting and results.	ANPC
D19	Final Plan for using and disseminating knowledge The Final Plan for using and disseminating knowledge (this document) describes the participants' actual achievements in dissemination and their plans at this time for the exploitation of the results - for the consortium as a whole, or for individual participants or groups of participants.	UMINHO
D20	Report on raising public participation and awareness This deliverable is a document reporting the extent to which actors beyond the research community have been involved to help spread awareness and to explore the wider societal implications of the proposed work. It includes the content provided in the training sections It includes training activities reporting and results.	UMINHO
D21	Project final conference This deliverable consists of a conference planned to present the CYCLOPS results to many different communities: scientific and technological, Civil Protection, GMES and Earth Observation.	UMINHO

3.4 CYCLOPS EVENTS

Activity	Dates/ Location	Type of audience	Countries addressed	Size of audience	Partner responsible /involved
CYCLOPS Project Open Conference	2006, June 16 Rome, Italy	International and national organisations: ESA, ASI TELESPAZIO, State departments and Civil Protections Regional Funcional Centre and Civil Protection Research and industry	Europe	55 people	All partners

The Open Conference was an event intended to present the CYCLOPS Project in a more general context of initiatives for the use of Grid technologies for Civil protection and GMES applications. The Conference was targeted at a composite audience comprising research, industry, government members.

A presentation by Prof. Mazzucato, member of the EGEE management board and director of INFN-Grid, where he presents the EGEE project and other related EU projects, EGEE applications and the outreach activities is available at: http://www.cyclops-project.eu/demo/pdf/EGEE.pdf.

For additional information go to: http://www.cyclops-project.eu/Default.aspx?id_menu=11&id_content=105

Project Management **Board** meeting	2006, July 08 Rome, Italy	Cyclops partners	All Countries in Consortium	11 people	DPC

The first CYCLOPS Project Management Board meeting took place at the premises of the Italian Department of Civil Protection in Rome. Eleven people of the Consortium Partners attended the meeting, three of them in phone conference.

In keeping with SSA guidelines the PMB outlined the importance of the dissemination phase and decided to start the discussion on the project Dissemination Plan in order to conceive the next coming deliverable on this important subject.

Project Management Board and **Technical Experts Group** meetings	2006, Nov. 30 Rome, Italy	Cyclops partners	All Countries in Consortium		All Partners

Activity	Dates/ Location	Type of audience	Countries addressed	Size of audience	Partner responsible /involved
CYCLOPS First Training Workshop	2007, April 11-13 Bologna, Italy	Stakeholders Civil protection	All Countries	14 people	INFN

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CYCLOPS First Training Workshop

from **Wednesday 11 April 2007 (09:00)** to **Friday 13 April 2007 (13:00)** (Europe/Rome) at **CNAF conferences room** chaired by: *Marco Verlato (INFN - PADOVA)* support: marco.verlato@pd.infn.it

Description: This is an user oriented tutorial, with both theoretical and hands-on sessions. A session for application developers about the use of gLite APIs and examples of applications succesfully ported on the grid is also scheduled. Only a basic knowledge of Linux user environment (Shell, SSH) and basic concepts of C++ and/or Java programming (only for the gLite APIs session) is requested by each trainee to follow the course.

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The First Training Workshop was held in Bologna (Italy) the 11-13/4/2007, at the conference room of the INFN-CNAF centre.

A total of 14 people attended the event, 8 of them coming from institutions related with the CYCLOPS activity. The participation was open also to interested people not strictly related to the CYCLOPS project. Being the main target of the event the representatives and ICT developers of the CYCLOPS partner institutions, the participation was unfortunately less than expected. It was mainly due to financial administrative issues which prevented the CYCLOPS partners from Portugal and Greece (ANPC, CP-CH and TEI-CR, three out of the seven initial CYCLOPS partners) to attend the event.

A full report is available as project deliverable D10.

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Activity	Dates/ Location	Type of audience	Countries addressed	Size of audience	Partner responsible /involved
Technical Management Board and **Project Management Board** meetings	2007, July 5-6 Rome, Italy	Stakeholders Civil protection	All Countries in Consortium		All Partners
INFN Training Course On Practical Aspects Of Application's Integration In Grid	2007, December, 11-23 Martinica Franca, Italy	Stakeholders Civil protection	All Countries in Consortium		INFN

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This two weeks school represented a great opportunity to learn about grid architecture and to practice with its available instruments in order to test what useful potential it offers for Civil Protection issues. At the end of the school, an application in use with the Italian Civil Protection called RISICO was ported to run in the GILDA grid environment.

The work carried out during this school was the basis of further developments bringing to G-RISICO, the grid-enabled version of RISICO leveraging on Open Geospatial Consortium (OGC) Web Services presented at the Second Training Workshop and then at the Mid-term Project Conference (in IBERGRID).

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Activity	Dates/ Location	Type of audience	Countries addressed	Size of audience	Partner responsible /involved
Technical Management Board meeting	2007, Dec. 20-21 Prato, Italy	Stakeholders Civil protection	All Countries in Consortium		DPC

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The WP4 Technical Meeting focused on the Geospatial service layer implementation on top of gLite and on the Porting of Civil Protection applications to the Grid. A full report is available at http://www.cyclops-project.eu/Default.aspx?id_menu=9&id_documento=36&id_versione=1
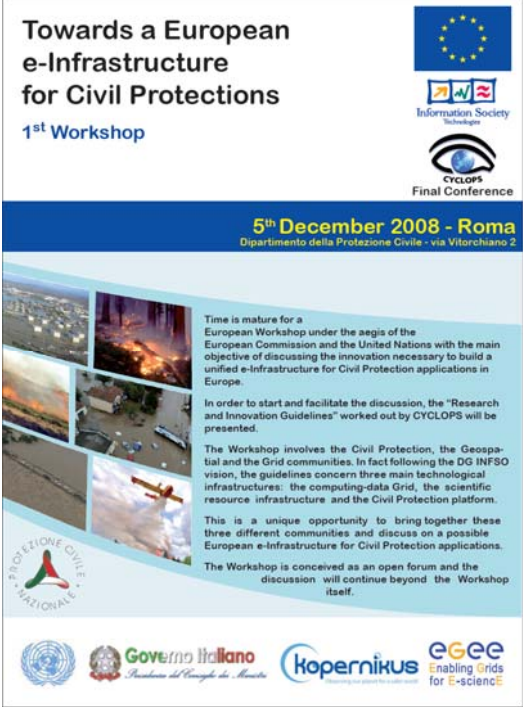
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Activity	Dates/ Location	Type of audience	Countries addressed	Size of audience	Partner responsible /involved
CYCLOPS Second Training Workshop	2008 May, 05 Chania, Greece	Stakeholders Civil protection	All Countries	31 people	INFN

from **Monday 05 May 2008 (09:00)** to **Wednesday 07 May 2008 (18:00)** (Europe/Rome) at **Chania, Crete, Greece** chaired by: *Marco Verlato (INFN)* **LOCAL ORGANISERS:** *Laboratory of Geophysics & Seismology, Technological Educational Institute of Crete - Civil Protection - Chania Prefecture* support: marco.verlato@pd.infn.it

Description: This is a grid user tutorial, oriented to Civil Protection applications community, with both theoretical and hands-on sessions. A session with examples of Civil Protection applications successfully ported on the grid is also scheduled. Only a basic knowledge of Linux user environment (Shell, SSH) is requested by each trainee to follow the course.

The Second Training Workshop was held in Chania (Greece) the 5-7/5/2008, at the conference room of the Panorama Hotel.

The layout of the course was very similar to the one of the First Training Workshop. It was in fact mainly targeted to people mobilised from those CYCLOPS partners (ANPC, CP-CH and TEI-CR institutions) that could not attend the previous event, and to the new partner (University of Minho) which joined in the second year of the project.

A total of 31 people attended the event, most of them coming from the Technological Institute of Crete. The overall evaluation parameter, computed from anonymous feedback forms as described in section 3.2, resulted in a score of 4.45.

A full report is available as project deliverable D13.

Activity	Dates/ Location	Type of audience	Countries addressed	Size of audience	Partner responsible /involved
CYCLOPS Midterm Project Conference	2008 May 14 Porto, Portugal	Project officers and partners GRID research community	All Countries	<large>	ANPC DPC EMA INFN IMAA UMINHO

The Midterm Project Conference was integrated within the 2nd Iberian Grid Infrastructure Conference, held at Faculdade de Engenharia de Universidade de Porto.

IBERGRID'2008 is the second edition of the Iberian Grid Infrastructure Conferences initiated in 2007 between Portugal and Spain, aiming to leverage the construction of a common Iberian Grid Infrastructure and the fostering of cooperation in the fields of grid computing and supercomputing. The main goal of the IBERGRID'2008 conference is to constitute a forum where the advances in the development of grid infrastructures, technologies and applications are discussed by the main players in Iberian and Latin American countries."

The CYCLOPS partners presented the project results in the form of posters, papers, presentations and a live demonstration of a forest fires risk assessment application.

A full report regarding IBERGRID and the CYCLOPS Midterm Conference is available as project deliverable D12 on the project web page.

Activity	Dates/ Location	Type of audience	Countries addressed	Size of audience	Partner responsible /involved
CYCLOPS Final Conference	2008 Dec., 5 Rome, Italy	Civil Protection, Geospatial and Grid communities	All Countries		DPC

The CYCLOPS Final Conference will take place jointly with the workshop "Towards a European e-Infrastructure for Civil Protections - 1st Workshop".

The full report for the Final Conference will be posted in the project web site as deliverable D21 as soon as it is available.
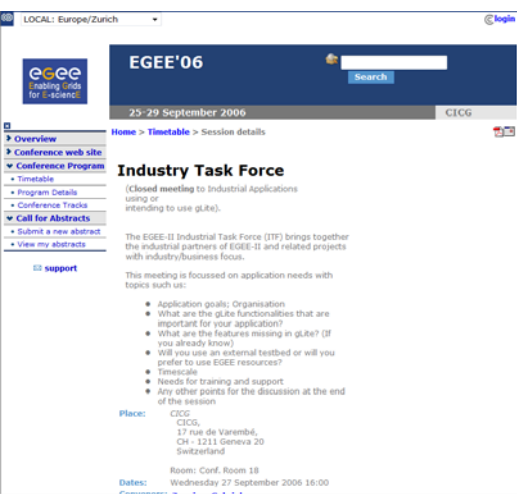
3.5　PARTICIPATION IN CONFERENCES AND WORKSHOPS
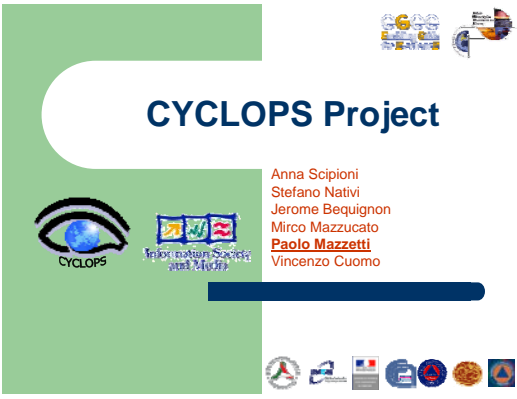
Activity	Dates/ Location	Type of audience	Countries addressed	Size of audience	Partners involved
EUMEDGRID 1st "Empowering eScience Across the Mediterranean"	2006, September 15 Rome, Italy	Scientific communities from countries across the Mediterranean	Mediterranean basin		INFN

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The objective of the conference was to present the vision of cross-national eInfrastructures as a driving force towards widening the European Research Area and bridging the digital divide between Europe and the neighbouring Mediterranean Countries.

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Activity	Dates/ Location	Type of audience	Countries addressed	Size of audience	Partners involved
EGEE'06 Conference	2006, Sept. 27 Genevre, Switzerland	Grid user communities, decision makers, resource providers and developers	All Countries		INFN IMAA DPC

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Lorenzo Bigagli (CNR-IMAA) presented CYCLOPS at EGEE'06 Conference of Geneva, in the context of the Industry Task Force Session.

The role of EGEE-II as incubator for many related projects like CYCLOPS shows itself also in the field of dissemination and outreach. In particular the Network Activity 2 (NA2) of the EGEE-II project has made publicity material and templates available on its websites to the related projects, giving them a head start for producing their own material. NA2 is also helping CYCLOPS by publicising important events on the website, in the EGEE-II newsletters, and by helping to distribute information about the project such as through the EGEE events or media contacts. The CYCLOPS project ID card is registered as EGEE Related Project on the EGEE site.

More information in http://www.cern.ch/egee-na2, http://indico.cern.ch/contributionDisplay.py?contribId=385&sessionId=114&confId=1504, and http://egee-technical.web.cern.ch/egee-technical/related-projects/list-projects.htm#CYCLOPS

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Activity	Dates/ Location	Type of audience	Countries addressed	Size of audience	Partners involved
INGRID'06 Workshop	2006, November 11 Braga, Portugal	Research, Industry	Portugal	100	IMAA

The INGRID Workshop was a preparation conference to the first call on the Iniciativa Nacional Grid (INGRID) in Portugal.

Paolo Mazzetti presented CYCLOPS at the Jornada InGrid '06 in Braga: Grid-technology, Geospatial Sciences and European Civil Protection applications

More information: http://www.lip.pt/ingrid06/

| **IST2006 Conference** | 2006, Nov. 20-22 Helsinky, Finland | Research, Industry Stakeholders Civil protection | All Countries | | DPC, CNR-IMAA |

IST 2006 was organized within the framework of the Finnish Presidency of the European Union by the European Commission's Directorate-General for the Information Society and Media, the Finnish Ministry of Trade and Industry and Tekes, the Finnish Funding Agency for Technology & Innovation.

The Conference Programme opened with a first day devoted to high-level policy discussions on what governments and public policy can do to help ICT contribute to an innovative Europe, with Days Two and Three are devoted to the Seventh Framework Programme and other topics surrounding European research and innovation.

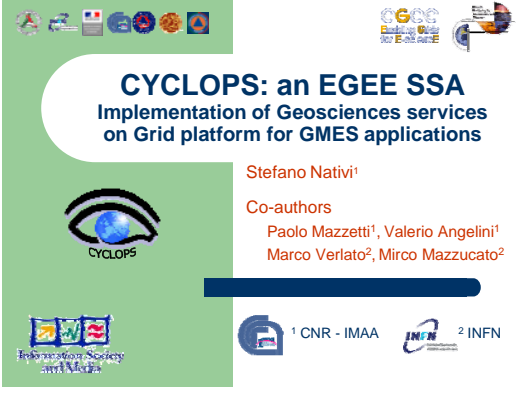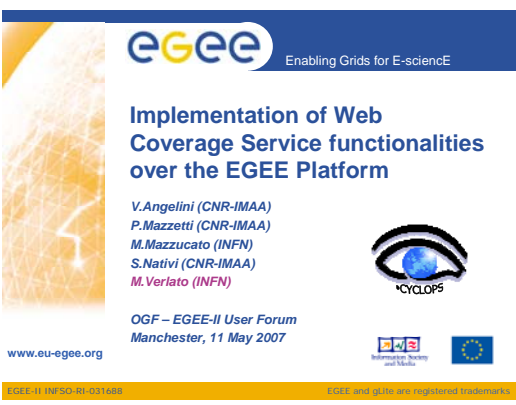| Activity	Dates/ Location	Type of audience	Countries addressed	Size of audience	Partners involved
2nd Grid & E-Collaboration Workshop for the Earth Science and the Space Community	2006, Dec 11 Frascati, Italy	Stakeholders Civil protection	All Countries		IMAA

	Lorenzo Bigagli presented CYCLOPS focusing on several project issues such as participants, objectives, CP applications requirements and research issues. Lorenzo Bigagli, Anna Scipioni, Stefano Nativi, Jerome Bequignon, Mirco Mazzucato, Vincenzo Cuomo. "CYCLOPS Grid for the Disaster Management Community", 2nd "GRID & e-Collaboration Workshop for the Earth Science and the Space Community" ESA-ESRIN, 11-12 December, 2006, Frascati, Italy.

Activity	Dates/ Location	Type of audience	Countries addressed	Size of audience	Partners involved
European Geoinformatics Workshop	2007, March 07 Edinburg, UK	Stakeholders Civil protection	All Countries		IMAA, INFN

	Paolo Mazzetti presented CYCLOPS at the European GeoInformatics Workshop. For further information go to http://www.nesc.ac.uk/action/esi/download.cfm?index=3406

Activity	Dates/ Location	Type of audience	Countries addressed	Size of audience	Partners involved
Open Grid Forum 20	2007, May 9 Manchester, UK	Research, Industry Stakeholders Civil protection	All Countries		IMAA, INFN

	Stefano Nativi presented CYCLOPS at the Open Grid Forum in Manchester during the OGC-OGF meeting.

Activity	Dates/ Location	Type of audience	Countries addressed	Size of audience	Partners involved
EGEE-II User Forum	2007, May 9-11 Manchester, UK	Research, Industry Grid Community	All Countries		INFN

	Marco Verlato from INFN Padova presented CYCLOPS at the EGEE User Forum. Further information in http://indico.cern.ch/getFile.py/access?contribId=180&sessionId=23&resId=0&materialId=poster&confId=18714 V. Angelini, P. Mazzetti, M. Mazzucato, S. Nativi, M. Verlato, "Implementation of Web Coverage Service functionalities over the EGEE Platform", proceedings of the OGF20, Manchester May 200

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Activity	Dates/ Location	Type of audience	Countries addressed	Size of audience	Partners involved
IUGG 2007 Conference	2007, July 04 Perugia, Italy		All Countries		INFN IMAA
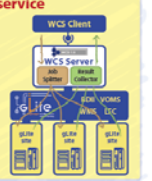
The CYCLOPS team presents the project's advances with a poster at the IUGG 2007 (International Union of Geodesy and Geophysics) in Perugia.

http://indico.cern.ch/getFile.py/access?contribId=180&sessionId=23&resId=0&materialId=poster&confId=18714

Activity	Dates/ Location	Type of audience	Countries addressed	Size of audience	Partners involved
EGEE'07 Conference	05 Oct 2007 Budapest, Hungary	Grid user communities, decision makers, resource providers and developers	All Countries		All partners

Marco Verlato, Paolo Mazzetti, Stefano Nativi and Valerio Angelini presented a poster and a demo at the EGEE07.

Marco Verlato, Paolo Mazzetti, Stefano Nativi and Valerio Angelini, Implementation of Geospatial services on Grid platform for Civil Protection applications, EGEE 07, 1-3 October, Budapest, Hungary.
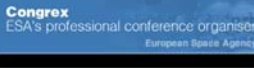
http://indico.cern.ch/getFile.py/access?contribId=180&sessionId=23&resId=0&materialId=poster&confId=18714

Activity	Dates/ Location	Type of audience	Countries addressed	Size of audience	Partners involved
Supercomputing SC'07 Conference	15 Nov 2007 Reno, USA		All Countries		INFN

The SC Conference is the premier international conference for high performance computing (HPC), networking, storage and analysis.

Marco Verlato presented a CYCLOPS poster at the INFN/EGEE/GRNET shared research exhibition area entitled "Implementation of Geospatial services on Grid Platform for Civil Protection Applications"

Activity	Dates/ Location	Type of audience	Countries addressed	Size of audience	Partners involved
3nd Grid & E-Collaboration Workshop for the Earth Science and the Space Community	2008, January 16 Frascali, Italy	Stakeholders Civil protection	All Countries		IMAA

Paolo Mazzetti presents CYCLOPS at the "3rd GRID & e-Collaboration Workshop for the Earth Science and the Space Community".

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Activity	Dates/ Location	Type of audience	Countries addressed	Size of audience	Partners involved
3rd EGEE User Forum	2008, Feb 11 Clermont-Ferrand, France	GRID Research community	All Countries		INFN IMAA

CYCLOPS participates in the 3rd EGEE User Forum with an oral presentation by Stefano Dal Pra and a poster by Valerio Angelini.

Mirko D´ Andrea, Stefano Dal Pra, Marco Verlato, Francesco Gaetani and Valerio Angelini, Grid computing for wildfire danger assessment: porting RISICO on gLite. , EGEE Forum, Clermont-Ferrand, France on 11-14 February, 2008

| **2nd Iberian Grid Infrastructure Conference** | 2008, May 14 Porto, Portugal | Project officers and partners GRID research community | All Countries | | ANPC DPC EMA INFN IMAA UMINHO |

IBERGRID'2008 is the second edition of the Iberian Grid Infrastructure Conferences initiated in 2007 between Portugal and Spain, aiming to leverage the construction of a common Iberian Grid Infrastructure and the fostering of cooperation in the fields of grid computing and supercomputing. The main goal of the IBERGRID'2008 conference is to constitute a forum where the advances in the development of grid infrastructures, technologies and applications are discussed by the main players in Iberian and Latin American countries."

The CYCLOPS partners presented the project results in the form of posters, papers, presentations and a live demonstration of a forest fires risk assessment application.

Deliverable D12 available on the project web site provides further information about IBERGRID and the CYCLOPS Midterm Conference,

Activity	Dates/ Location	Type of audience	Countries addressed	Size of audience	Partners involved
Open Grid Forum 23	2008, June 03 Barcelona, Spain	Research, Industry Stakeholders Civil protection	All Countries		IMAA

CYCLOPS Project

CYber-Infrastructure for CiviL protection Operative ProcedureS

Stefano Nativi[1], Paolo Mazzetti[1] and Marco Verlato[2]

[1] Italian National Research Council-IMAA
[2] INFN

OGC-OGF Collaboration Workshop
(Barcelona, 3 June 2008)

Open Grid Forum is an open community directed towards the adoption of applied distributed computing, as it is critical to developing new, innovative and scalable applications and infrastructures that are essential to productivity in the enterprise and within the science community.

Stefano Nativi presented "CYCLOPS talk from Stefano Nativi" at the Open Grid Forum in Barcelona during the OGC-OGF meeting.

For further information go to http://www.ogf.org/gf/event_schedule/index.php?id=1232 and to http://www.cyclops-project.eu/Default.aspx?id_menu=11&id_content=133&id_img=1

Activity	Dates/ Location	Type of audience	Countries addressed	Size of audience	Partners involved
World Water Congress	2008, September, 1-4 Montepellier, France	Earth Sciences community	All Countries		EMA

Vincent Thierion presented Cyclops results with an article and an oral presentation regarding "Floods forecasting and warning operations enhancement by Grid, technology adoption in Civil Protection organization"

More information about IWRA World Water Congress: http://wwc2008.msem.univ-montp2.fr/index.php?codelang=en&page=about_iwra

Activity	Dates/ Location	Type of audience	Countries addressed	Size of audience	Partners involved
EGEE'08 Conference	2008, September 26 Istanbul, Turkey	Grid user communities, decision makers, resource providers and developers	All Countries		All partners

The Best Application Presentation award given to the CYCLOPS team - Marco Verlato (INFN), Stefano Dal Pra (INFN) and Valerio Angelini (CNR-IMAA) - for their application presentation "G-RISICO: A Wild Fire Risk Assessment application running on an advanced Grid infrastructure."

António Pina presented the poster "EGEE Roll - A framework to Fully-automated site Deployment & Management"

Further information in https://pop.cp.di.uminho.pt/cyclops/wp-content/uploads/2008/09/egee-istambul-1.pdf

Activity	Dates/ Location	Type of audience	Countries addressed	Size of audience	Partners involved
Super Computing SC'08 Conference	2008, Nov., 15-21 Austin, Texas	Grid and High Performance research communities	All Countries		INFN

	The SC Conference is the premier international conference for high performance computing (HPC), networking, storage and analysis.
	INFN and the Italian Grid Infrastructure (IGI, www.italiangrid.org) will be at SC08 with an exhibition booth in the Research Area. A wide range of thematic posters showcasing the various international projects and experiments INFN is involved with will be exhibited. From High Energy Pyhisics (LHC, ATALS, CMS. Lcg-CAF and the Italian LHC TIER1, managed by INFN-CNAF), to Bioinformatic (LIBI), to Civil Protection Operative Procedures (CYCLOPS) to Biology (e-NMR) and much more.
	For further information go to: http://www.scientific-computing.com/show/show.php?show_id=5

3.6 LECTURES AND SEMINARS

Activity	Dates/ Location	Type	Type of audience	Countries addressed	Size of audience	Partner
Invited seminar at the Penn State University - Dept. of Mathematics	2006, May 30 State College (PA), USA	Seminar	Educational, Scientists	International	About 20	
Invited lecture to the International Conference on Environmental Observations, Modeling and Information Systems ENVIROMIS-2006,	2006, July 1-8 Tomsk, Russia	Conference and International School	Earth Sciences Scientific communities, industry	International, Russia	Around 80 people	

Each year SCERT organizes international scientific events comprising young scientists' schools and conferences. Ultimate aim of these events is growing up new generation of Earth and Environmental Science researchers ready to work in this interdisciplinary field concerned with the interaction of processes that shape our natural environment (ecology, geosciences, hydrology, and atmospheric sciences and benefit from inherent closely coupling the areas of e-Science and Earth Science, thus shaping and paving the way for understanding both global and regional environmental processes.

Siberian Center for Environment Research and Training (SCERT) is a multidisciplinary research center comprising efforts of several research Institutes of Siberian Branch RAS and Universities from Tomsk, Barnaul, Irkutsk, Krasnoyarsk, Novosibirsk and Moscow in area of regional climate change monitoring and   odelling, regional climate impact applications. The Center is located at Tomsk Akademgorodok.

Activity	Dates/ Location	Type	Type of audience	Countries addressed	Size of audience	Partner
Invited seminar at NCAR/UCAR	2006, July 27 Boulder (CO), USA	Lecture	Earth Sciences Scientific communities, NSF people	International, USA	Around 20 Webcasted	

The US NCAR, UCAR and UOP are together dedicated to: understanding our changing Earth system, educating about the atmosphere & related sciences, supporting a global community of researchers, benefiting society through science and technology. UCAR, NCAR, and UOP are part of a collaborative community dedicated to understanding the atmosphere—the air around us—and the interconnected processes that make up the Earth system, from the ocean floor to the Sun's core.

The National Center for Atmospheric Research and the UCAR Office of Programs provide research, facilities, and services for the atmospheric and Earth sciences community. NCAR and UOP are managed by the nonprofit University Corporation for Atmospheric Research.

NCAR supports the community of atmospheric and geoscience researchers with tools—such as aircraft and radar, to observe the atmosphere, and technology and assistance—to interpret and use these observations, including supercomputer access, computer models, and user support. NCAR research projects cover a vast array of topics and are collaborations between NCAR scientists and university researchers: atmospheric chemistry—such as the chemical structure of healthy and polluted air, climate—including temperature, rainfall, winds, and extreme events over decades or centuries, from prehistoric times to the present and into the future, weather ingredients—such as cloud physics, storm structure, and other keys to improved weather forecasting, weather hazards to transportation—including detection and warning systems for turbulence and icing in the air and on the ground interactions between the Sun and Earth—including solar weather, computer science innovation—for understanding and visualizing the whole Earth system, the role of humanity in both creating change and responding to weather and climate.

More information is available at: http://www.ucar.edu/org/

Activity	Dates/ Location	Type	Type of audience	Countries addressed	Size of audience	Partner
Invited seminar at the 1st ADAGUC Workshop	2006, October 3-4 Utrecht (NL)	Workshop	Research, Stakeholders, Industry	The Netherlands, Europe	About 30	

ADAGUC (Atmospheric Data Access for the Geospatial User Community) is a project funded in the framework of the Dutch Innovation program Space for geo-information; it managed by the KNMI.

The atmospheric and geospatial communities are still separate worlds with their own tools and data formats. It is extremely difficult to easily share data among scientists representing these communities without performing some cumbersome conversions. This proposal aims to reduce the need for scientists to invent their own converter tools. Selected space borne atmospheric datasets will be made accessible to a GIS system in order to be submitted to data comparison, resampling, selection, manipulation and visualization. The user community will be intensively involved in the project to obtain a high fitness for use. The deliverables of this project are: Open Source conversion tools, selected atmospheric datasets in GIS format and a web service to demonstrate the usability of the above to the geospatial and atmospheric community. Dissemination of results is pursued by publications, workshops and (inter)national cooperations.

More information are available at: http://adaguc.knmi.nl/

3.7 MEETINGS

Planned / actual dates	Type, objective	Type of audience Size of audience	Countries addressed	Partner responsible /involved
Valabre (FR) 11-12 July 2006	Risk-EOS User Executive Board Meeting Fires and Flood	Research, Industry Stakeholders Civil protection	Partners	Infoterra/DDSC
AMPHORE Rome 11-12 September 2006	Final meeting	Research Civil protection	Partners and other civil protection	ARPA Piemonte
Preview Valabre (FR) 10 – 11 October 2006	Preview User Task Force	Research, Industry Stakeholders Civil protection	Partners and other civil protection	DDSC
Risk-Aware Rome 20-21 November 2006	Final Meeting	Research Civil protection	Partners and other civil protection	SMR – Emilia Romagna

3.8 TRAINING

As stated in [1], one of the Project Objectives of CYCLOPS is "to carry out Civil Protection and Grid Communities inter-dissemination". The coordinator of Work Package 2 in charge of carrying out the Task 2.1, the INFN, aimed to organise, whenever possible and in cooperation with the EGEE corresponding activities, dissemination and training events where the current architecture of the EGEE middleware and its planned evolution were demonstrated to the Civil Protection community. The documentation was made available to the public on the project web site. Furthermore, EGEE Conferences and the EGEE User Forum events provide dissemination of the knowledge of Grid technologies to a wide spectrum of users, and sometimes also host basic training events which can be exploited by CYCLOPS members.

3.8.1 GILDA

A strategic tool and key enabler for training activities will be the INFN GILDA virtual laboratory for Grid dissemination which was originally developed and successfully used in the context of the EGEE Project.

GILDA is a complete and fully functional Grid infrastructure whose elements are:

- a test-bed consisting, as of today, of 15 sites located on 3 continents;
- a dummy Certification Authority which can issue both user and server certificates (more than 1600 issued so far in EGEE);
- a dummy Virtual Organization including the Virtual Organization Membership Service (VOMS);
- a complete set of documentation about how to become a GILDA user and/or join GILDA as a site;
- a complete set of grid portals (the GILDA Grid Tutor and the GILDA Grid Demonstrator) both based on the GENIUS portal, which are fully compliant with the gLite middleware;

- a full set of demonstrative applications that can be used to impress and stimulate attendees of dissemination events.

GILDA runs the latest stable versions of the gLite middleware so it is the ideal environment to start developing the interfaces between the Grid middleware and the CYCLOPS applications which then have the possibilityof being used on the CYCLOPS Grid-based platform.

3.8.2 Training Sessions

Dates	Type, location	Users involved and countries	Partner responsible /involved
2006, June 16	Open Conference Rome – Italy	Civil Protection Italy, France, Portugal and Greece	INFN/DPC/SNBPC/ DDSC/CH-GR
2007, April 11-13	First Training Workshop Bologna – Italy	Civil Protection Italy, France, Portugal and Greece	INFN/DPC/SNBPC/ DDSC/CH-GR
2007, December, 11-23	INFN Training Course On Practical Aspects Of Application's Integration In Grid Martinica Franca, Italy	Stakeholders Civil protection	INFN
2008, May 5-7	Second Training Workshop Chania, Greece	Civil Protection Italy, France, Portugal and Greece	CH-GR/INFN/DPC/SNBPC/DDSC

3.9 PROJECT REFERENCES

The Cyclops consortium members made dissemination contributions by delivering several research papers, posters and presentations in conferences, periodical journals, annual reports, GMES and EGEE publications, which are listed in the following table

Reference	Partners involved
A. Esteves, J. Macedo, A. Serrano, V. Sá, L. Lopes, M. Caldas, CYCLOPS SESSION "Enabling mote-based Environment Sensor Network for Civil Protection Grid Based Applications", Cyclops Session, 2nd Iberian Grid Application Conference, Porto, 12-14 May, 2008.	UMINHO
A. Pina, B. Oliveira, A. Serrano, V. Oliveira, "EGEE Roll - A framework to Fully-automated site Deployment & Management" (poster), EGEE'08 Conference, Istanbul, Turkey, 22 - 26 September 2008	UMINHO
A. Pina, B. Oliveira, A. Serrano, V. Oliveira, "EGEE Site Deployment & Management Using the Rocks toolkit", 2nd Iberian Grid Infrastructure Conference, Porto, 12-14 May,2008	UMINHO

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Lorenzo Bigagli, Anna Scipioni, Stefano Nativi, Jerome Bequignon, Mirco Mazzucato, Vincenzo Cuomo. "CYCLOPS Grid for the Disaster Management Community", 2nd "GRID & e-Collaboration Workshop for the Earth Science and the Space Community" ESA-ESRIN, 11-12 December, 2006, Frascati, Italy.	DPC, IMAA, INFN
M. D'Andrea , S. Dal Pra , V. Angelini , P. Fiorucci F. Gaetani, P.Mazzetti, M. Verlato G.RISICO: a grid architecture for high resolution nation-wide forest fire risk assessment. Geophysical Research Abstracts, Vol. 10, EGU2008-A-07307, 2008, SRef-ID: 1607-7962/gra/EGU2008-A-07307, EGU General Assembly 2008	INFN, IMAA
Marco Verlato, Implementation of Geospatial services on Grid Platform for Civil Protection Applicatrions. International Conference on High Performance Computing, Networking, Storage and Analysis, November 10-16, Reno, USA.	INFN
Marco Verlato, Paolo Mazzetti, Stefano Nativi and Valerio Angelini, Implementation of Geospatial services on Grid platform for Civil Protection applications, EGEE 07, 1-3 October, Budapest, Hungary. http://indico.cern.ch/getFile.py/access?contribId=180&sessionId=23&resId=0&materialId=poster&confId=18714	INFN, IMAA
Marco Verlato, Stefano Dal Pra, Valerio Angelini, "G-RISICO: A Wild Fire Risk Assessment application running on an advanced Grid infrastructure." Application Presentation at EGEE'08 Conference, Istanbul ,Turkey, 22 - 26 September 2008 (won the Best Application Presentation award)	INFN, IMAA
Mirko D´ Andrea, Stefano Dal Pra, Marco Verlato, Francesco Gaetani and Valerio Angelini, Grid computing for wildfire danger assessment: porting RISICO on gLite. , EGEE Forum, Clermont-Ferrand, France on 11-14 February, 2008	INFN, IMAA
Monique Petitdidier, Geoinformatics and Grid, Cyclops Session, 2nd Iberian GRID Application Conference, 12-14 May 2008.	Invited presentation
P. Mazzetti, S. Nativi, V. Angelini, M. Verlato, A. Pina, P. Fiorucci "A Grid Platform for the European Civil Protection e-Infrastructure: the Forest Fires use scenario", 2nd Iberian GRID Application Conference, 12-14 May 2008.	IMAA, INFN, UMINHO
Paolo Mazzetti , Grid-technology, Geospatial Sciences and European Civil Protection applications, INGRID 06, 11 November, Braga, Portugal.	IMAA
Paolo Mazzetti, Stefano Nativi, Mirco Mazzucato, Marco Verlato and Jerome Bequignon "CYCLOPS-Project: Implementation of Geosciences services on Grid platform for GMES applications", OGF, 7-9 May, Manchester, UK. http://www.nesc.ac.uk/action/esi/download.cfm?index=3406	IMAA, INFN

Reference	Partners involved
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Stefano Nativi, The Cyclops Project, 2nd Iberian GRID Application Conference, 12-14 May 2008.	IMAA
Thierion V., Ayral P.-A., Sauvagnargues-Lesage S., Bressand F., Nardin P., Sorani R., (2008), Floods forecasting and warning operations enhancement by Grid, technology adoption in Civil Protection organization, the 13th IWRA World Water Congress 2008, Montpellier, 1-4 September 2008, 13p.	EMA
Thierion V., Ayral P.-A., Sauvagnargues-Lesage S., Nardin P., (2008), Flash flood management: the CYCLOPS French use case, 2nd Iberian GRID Application Conference, 12-14 May 2008.	EMA
Thierion V., Ayral P.-A., Sauvagnargues-Lesage S., Nardin P., (2008), CYCLOPS Session, Flash floods Applications, 2nd Iberian GRID Application Conference, 12-14 May 2008.	EMA
V. Angelini, P. Mazzetti, M. Mazzucato, Implementation of Web Coverage Service functionalities over the EGEE. EGEE'06. 25-29 September 2006, Geneva Switzerland.	IMAA, INFN
V. Angelini , P. Mazzetti , S. Nativi , P. Fiorucci , M. Verlato , Implementation of geospatial services in Grid: the RISICO case study, Geophysical Research Abstracts, Vol. 10, EGU2008-A-05228, 2008, SRef-ID: 1607-7962/gra/EGU2008-A-05228,EGU General Assembly 2008.	IMAA, INFN
Xavier Viegas, Decision Support Tools in Forest Fire Management, Cyclops Session, 2nd Iberian GRID Application Conference, 12-14 May 2008.	Invited presentation

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4 PLANS FOR EXPLOITATION

As stated in the CYCLOPS' technical annex, the success of the project is strongly dependant on the exploitation of its results. Indeed, as a support action, the number and quality of following initiatives are the real measures of its success. Thus, the exploitation plan is a valuable resource to enhance the impact of the project. The following sections present a description of the exploitation plans of the CYCLOPS partners in the areas related to the project.

4.1 INFN

INFN intends to consolidate the results obtained within CYCLOPS which concern the grid-enabled Open Geospatial Consortium Web Services (OGC-WS, a.k.a. OWS).

For this purpose a G-OWS working group has been promoted to join the effort of INFN and CNR-IMAA CYCLOPS partners with the ELSAG-DATAMAT team participating in GENESI DR project and the ELETTRA Synchrotron Light Laboratory team participating in DORII project.

GENESI DR and DORII are two FP7 European co-funded projects started in 2008 and working in the field of grid services for Earth Sciences and Sensor Observations.

CYCLOPS management signed a MoU with these two projects with the goal of cooperating in order to achieve the following objectives:

1. To address the Open Grid Forum (OGF) standardization needs as far as the Earth and Space Science Community, GMES and Grid Community are concerned;

2. To establish an open forum to govern the implementation specification for OGC services on the gLite platform. This would allow:
   a. Effective grid-enabled implementations leveraging gLite assets;
   b. Real interoperability among different implementations;

3. To contribute to the OGC-OGF initiative: the OGF in fact signed a MoU in January 2008 to collaborate with the OGC. The first OGC-OGF Collaboration Workshop was held in February 2008 at OGF-22 event in Cambridge, Massachusetts and a second one in June 2008 at OGF-23 event in Barcelona, Spain. CYCLOPS team actively participated in the last event.

The G-OWS working group was set up to realize the above objectives, and already met a number of times during the last quarter of the CYCLOPS lifetime.

A short-medium term plan was defined in these meetings, the main steps of which are summarized below:

1. To release a standard gLite package consisting of the following OWS implementations:
   a. Web Coverage Service (WCS)
   b. Web Processing Service (WPS)

   This gLite package will be initially released as a new grid profile in the context of the INFNGRID Release, serving the national Italian Grid Infrastructure;

2. To schedule CYCLOPS implementations of:
   a. WFS (Web Feature Service)
   b. CSW (Catalog Service for Web)

3. To schedule DORII implementations of the SOS (Sensor Observation Service);

4. To disseminate the Working Group activities;

5. To reach out to other projects and invite them to join the Working Group;

6. To present these activities at the next EGU-ESSI meeting of Vienna, in April 2009.

In order to provide sustainability for these efforts and leverage their results in relation to the future European Grid Infrastructure (EGI), the partners recommend that a Specialised Support Centre (SSC) be created to provide continuity, coordination and representation of the teams involved in these projects.

SSCs are functional units proposed by the EGI_DS project as part of a set of Extended Support Services in the beginning phase of the future European Grid Infrastructure.

EGI_DS is a EU funded FP7 project representing an effort to establish a sustainable grid infrastructure in Europe. Driven by the needs and requirements of the research community, it is expected to enable the next leap in research infrastructures, thereby supporting collaborative scientific discoveries in the European Research Area (ERA). EGI is expected to be implemented before the end of the EGEE-III project to assure continuity to its user communities and enhance collaborative efforts with other EU projects.

These Extended Support Services are specifically designed to provide practical sustainability and representation of the growing grid user community at the European level. In particular, SSCs are a means for providing appropriate channels for the representation of user requirements and high level software tools that work well with, and provide enhanced functionality with respect to, the EGI middleware (UMD: Unified Middleware Distribution). SSCs will also provide umbrella services at a European level for collaborative efforts by groups of projects such as those described here, such as elements of representation, support for standardisation working groups, etc.

Specifically, an EGI SSC for the Civil Protection sector of the Earth Sciences should fulfill these tasks:

- Support and coordination for the work of the OGC-OGF.
- Continued maintenance of the project repositories and portal.
- Representation of user requirements for the CP community, in cooperation with the larger ES community (this presupposes the existence of a more general ES SSC)
- Provision of formal representation for the high level WCS and WPS tools vis à vis the process of review and selection of External and UMD Candidate Software.
- Participation in planning activities to extend the benefits of these products at both European and international level.

To complement this effort, the partners will provide manpower to maintain communications with the CP SSC, and to contribute to central services such as the Application Database, the CP section of the ES portal, and so on.

References:

D4.4, Final draft of EGI blueprint proposal, http://www.eu-egi.eu/blueprint.pdf

D3.1, First EGI functions definition, http://www.eu-egi.eu/functions.pdf

EGI Knowledge Base, http://knowledge.eu-egi.eu

4.2   IMAA

G-OWS WG (Grid-enabled Open-Geospatial Web Services Working Group) is a Working Group established as an initiative of three consortia of EC-funded Projects (CYCLOPS, GENESI-DR and DORII) with the main goal of coordinating efforts and harmonizing solutions in the field of grid-enabled geospatial services.

The main objectives are:

1)   To address the OGF standardization needs as far as the Earth and Space Science Community, GMES and GLite are concerned;

2)   To establish an open forum to govern the implementation specification for OGC services on the GLite platform. This allows:

    a)   Effective grid-enabled implementations leveraging GLite assets;

    b)   Real interoperability among different implementations;

3)   Contribution to the OGC-OGF initiative.

Reference:

https://sites.google.com/site/gowswg

4.3   ARMINES/EMA

Dissemination opportunities

During the second part of project the dissemination of CYCLOPS knowledge was organized at international, national and regional levels.

At the international level, ARMINES/EMA participated in the CYCLOPS events IBERGRID 2008 (Porto, 12-14 may 2008) [D12] and in the 2nd training workshop (Chania, 5-7 may 2008) [D13].

During the IBERGRID international symposium, a poster [EMA1] and an oral conference [EMA2] were presented.

The ARMINES/EMA CYCLOPS results were presented at the 13th IWRA World Water Congress (Montpellier, France, 1-4 September 2008). An oral conference and an article were produced on the flash flood use-case Grid adoption [EMA3].

More information about IWRA World Water Congress is available at http://wwc2008.msem.univ-montp2.fr/index.php?codelang=en&page=about_iwra.

At the national level, CYCLOPS knowledge was presented to the flood warning service (SCHAPI) and to the French EGEE actors, members of the Degree European project.

This dissemination was made, notably, during the PhD board of Vincent Thierion which was organized in July 2008.

On a regional scale, dissemination of CYCLOPS knowledge is organized around the end-user of flash flood forecasting application and the regional contact of EGEE French partner.

The flood warning service of Gard Region (SPC-GD) is the principal end-user of Grid-enabled Civil Protection application about flood forecasting (French use case). Many meetings were organised during the project. The goals of these meetings were (1) to define the requirements, (2) to approve technical choices (models, user interface, …) and (3) to explain the progress of CYCLOPS project.

Recently (October 2008), some contact took place with French Regional EGEE VO. The reasons for this meeting were to present the CYCLOPS project and the flash flood forecasting application and to see the opportunity for this centre to integrate the VO CYCLOPS applications, in particular the flash flood forecasting workflow.

Prospects for further dissemination

The next step of ARMINES/EMA for the dissemination of knowledge is to produce two articles for international publications.

The first is an article concerning GRID technologies and flash flood forecasting. The journal envisaged is the Earth Sciences Informatics. The second paper is more concernrd with flash flood forecasting and therefore a journal about hydrology is being considered (journal of hydrology for example).

The first paper will be submitted at the end of 2008, the second during the first halfof 2009.

A (restitution??) (repeat??) of the CYCLOPS final meeting will be organized for the French actors who participated in the project, notably the Flood warning Service at national (SCHAPI) and regional levels (SPC-GD).

Finally, for the French partner (DDSC and ARMINES/EMA) the last dissemination of CYCLOPS knowledge event will be the oral examination of Vincent Thierion PhD (October 2009).

Exploitation

The involvement of EMA in the CYCLOPS project enabled the following achievements:

1- Recoding and porting Alhtair model on the Cyclops grid site and permitting the first test on the effectiveness of grid technology for hydrological modeling aspects

2- Inclusion of the entire data files in a standard way of using NetCDF file format enabling meteorological and hydrological data including ???

3- Development of specific geospatial web services to request subsets of rainfall, catchments, hydrological conditions and hydrographs data.

4- Progressive development of an integrated platform based on the grid and webmapping technologies to gather French, and even European, floods research actors

The Cyclops project enables the following new perspectives within our research perspectives:

1- Computational and storage capabilities on-demand, permitted to Ema-Armines, in order to develop new competencies for the modeling aspect of our research. Alhtair first experimentations have demonstrated the utility of grid technology for intensive simulations processes and large amount of data storage. In this manner, expertise shows new potentialities for other topics developed in our laboratory, such as forests fires modeling, as well as industrial hazards simulations, in porting respective applications on the grid infrastructure and improving our tools provider specialty on a larger scale.

2- Through Alhtair experimentations and its new modeling potentialities, we would particularly like to involve flood operational units such as SPC-GD at the regional level and SCHAPI as the national level, to progressively design a flood monitoring and forecasting platform dedicated to research issues as well as to operational solutions. This approach could be developed in following the virtual organization concept and its ICT components : grid and webmapping technologies.

3- From a hydrological point of view, in following the in-progress flash-flood research, grid technology could provide new computational capabilities to improve hydrological modeling in-depth by using more physical parameters and/or by porting new parallelised geoprocessing algorithms. These requirements appear to be essential to definitively improve flash floods processes knowledge and operations.

4- The real utility of the grid technology for our topic and more widely for Civil Protection discovered during this project incites us to take part in the present French production grid development in providing CPUs and storage disks for the on-going regional grid infrastructure. At present, collaborations with French EGEE partners have to be continued and improved.

References:

Thierion V., Ayral P.-A., Sauvagnargues-Lesage S., Bressand F., Nardin P., Sorani R., (2008), Floods forecasting and warning operations enhancement by Grid, technology adoption in Civil Protection organization, the 13th IWRA World Water Congress 2008, Montpellier, 1-4 September 2008, 13p.

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Thierion V., Ayral P.-A., Sauvagnargues-Lesage S., Nardin P., (2008), CYCLOPS Session, Flash floods Applications, 2nd Iberian GRID Application Conference, 12-14 May 2008.

4.4   ANPC

In CP activities there is a need to prepare information for field operatives, with some difficulties in collating information from various sources via internet, satellite, and telephone, such as research institutions, meteorological institutes, laboratories, and so on. There were still gaps in the system which needed to be addressed.

It must be stressed how important it is for CP agencies to work together with the scientific community to provide decision-makers with a higher level of primary information, which can then be used to save lives and

reduce property damage. CP agencies currently lack technical background, and cooperation with operatives in the technical domain (such as universities) is imperative in order to build the necessary capacity for using new technology to their best advantage.

With an approach such as CYCLOPS the task would be made much easier as all information would be available on one single network and with higher computational capacity . If national information could be complemented with European information they would have better large-scale understanding of a problem or crisis.

At present the CP community is only monitoring situations, not having the capability to analyse the information it is currently producing and CYCLOPS Project offers a solution with its software. The outcome from Cyclops should be to complement information on a national basis and to help CP activities working abroad.

Standardization issues should be properly addressed so that information from heterogeneous systems could be composed and processed.

The expert use of technology is important but it must be kept in mind that though the intended end-users are CP agencies, they are not expert users. There is therefore a need to decide on the best practices to be exported, in order to produce expert CP users, with different profiles.

4.5   UMINHO

CYCLOPS posed the opening questions a) "what characterizes a Civil Protection application?"; b) "what are the limitations in running them on the Grid?" and c) "what needs to be implemented in the EGEE middleware to better support CP applications?". CYCLOPS envisions support for the most demanding requirements of Civil Protection applications in an advanced computing infrastructure to which access is mediated by a Grid middleware stack..

At UMINHO the investigation will proceed towards the development of a research framework based on the CYCLOPS model. This framework must not only define the generic elements of an application, but also define the interfaces to be used, the integration with existing CP systems, and the requirements for the infrastructure management. It must consider safety-critical applications, sensor-based applications or resource-tracking applications and identifying the technical dependencies that may condition the computing infrastructure. It also needs advanced security policies to handle the complex data policies typical of the Civil Protection domain, including strict requirements of integrity, confidentiality and data/services access control that applications impose on the enabling platform. Moreover, to complete their tasks, applications need to interact with external systems such as existing Grid platforms, security systems, government services, sensor networks, and spatial data infrastructures. At the same time, additional low level guarantees that cannot be provided at a higher level need to be considered, important for critical applications, real-time services, atomic computing operations, assured dependability, resiliency and load adaption, among others [7].

UMINHO is the leader of a joint research project with Universidade de Coimbra - CROSS-Fire: Collaborative Resources Online to Support Simulations on Forest Fires [1] which focuses on topics related to decision support to control forest fires and on porting the FireStation [2] simulation application to the EGEE Grid. CROSS-Fire is funded by the Portuguese National Grid Initiative to demonstrate the potential of Grid computing for decision-making support in forest fire control and for deploying interoperable grid applications and services among independent Civil Protection related organisations. The required activities to reach these aims include (i) to enhance and tune the models and algorithms used in forest fires simulation; (ii) to use appropriate data visualization techniques and tools to process output data from the simulator; (iii) to develop a grid-enabled framework to run multi-paradigm interactive applications; (iv) to develop standard and interoperable Web Processing Services for fast and reliable emergency CP activities; (v) to deploy a grid portal within EGEE for a CP environment to control forest fires; (vi) to validate the overall decision support system in real situations: in ANPC decision centres (CDOS/CNOS). CROSS-Fire must also produce enhanced collaboration methods with remote experts and services from dispersed entities. Cross-Fire's initial

application domain included the Portuguese territory and NGI. However, because of UMINHO's participation in EELA-2 consortium, integrated in the Portuguese JRU, this domain was extended to the rest of Europe and to Latin America, studying applications that run in a larger grid infrastructure which traverses continents.

The research path followed by UMINHO in Cyclops led to the development of the EGEE Roll [3], a Rocks toolkit based installation tool that supports an almost automatic installation of EGGE sites. It focused on the design and support for an EGEE test bed platform for Civil Protection. The existing platform will be extended in order to provide support for experimental infrastructures in which to test and validate the functional and non-functional requirements of the CP applications, such as computational power and scalability, storage capabilities, connection bandwidth, time of response and quality of service.

A pilot site established in partnership with ANPC, grid.prociv.pt, will be used for the experimental work to run and evaluate civil protection application porting, if possible starting with RISICO and Althair, CYCLOPS use case applications, and to serve as a testing infrastructure for future CP Grid applications.

The EGEE Grid middleware will be experimented with to encompass important outcomes from European projects which are especially relevant in this context: GRIDCC/DORII directed towards provisioning the tools to manage instrumentation elements, and for the orchestration of multiple Grid resources in a timely manner with quality of service guarantees [4]; Int.EU.Grid that deals with providing multi-site interactivity and parallel computing in a Grid infrastructure [5], and AccessGrid that addresses risk awareness and consideration in SLA negotiation, self-organising fault-tolerant actions, and capacity planning [6].

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[1] Project CROSS-Fire Web page, [online] 2008. http://cctc.uminho.pt/projects/CROSS-Fire.

[2] A. M. G. Lopes, , a, M. G. Cruzb and D. X. Viegas, "FireStation — an integrated software system for the numerical simulation of fire spread on complex topography", Environmental Modelling & Software, Volume 17, Issue 3, 2002.

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[4] A.S.McGough, et al., "GRIDCC: A Real-time Grid workflow system with QoS". Scientific Programming. Dec, 2007, Vol. 15, 4.

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