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PHOSPHORUS

Lambda User Controlled Infrastructure for European Research

Integrated Project

Strategic objective:
Research Networking Testbeds

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Annual Report on Dissemination Activities

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

Abstract

This deliverable provides a comprehensive report of all dissemination activities that took place during first year of the project. It reports on all events, conferences, journals and information material that ensure that the PHOSPHORUS project is well-known by the research community.

This is the first release of the Annual Report of Dissemination Activities. Subsequent releases are expected in M18 and M30.

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0   Executive Summary

The ultimate goal of the PHOSPHORUS project is to disseminate procedures, toolkits and middleware to EU NRENS and their users to enable authorized end-to-end dynamic service provisioning across Europe and worldwide heterogeneous network infrastructure.

Successful dissemination activities such as the project website, newsletters, concertation and technical meetings, and through conferences and journals publications took place during the year. Information advertising material for the PHOSPHORUS project was distributed in many events.

All the dissemination activities that took place during the year are included in this deliverable.

Section 1, **Internal Dissemination,** presents a summary of the means that support internal dissemination within the project.

In section 2, **Major External Dissemination**, a description of all PHOSPHORUS advertisement materials that were prepared during the year for the purposes of spreading information about the project is provided. Also presented in this section are the events in which PHOSPHORUS was presented or advertised by means of testbed demos, booths, PHOSPHORUS posters, briefcase, brochure, sweets and T-shirts. The section details a short text describing the PHOSPHORUS presence at each event. A short description of each major activity that took place is detailed. The descriptions explicitly mention relevant details such as website addresses (URLs), dates and PHOSPHORUS partners involved in each activity. In this section, a list of all journal papers accepted for publications that relate to the project is provided.

Section 3, **Other External Dissemination**, lists other dissemination activities (conferences and journals) that acknowledge the PHOSPHORUS project.

Section 4, **Future Dissemination Activities,** concludes the deliverable with a list of all dissemination activities foreseen for the following years. This section lists only the activities PHOSPHORUS is already scheduled to be represented at.

1 Internal Dissemination Activities

1.1.1 Project website (Private Section)

The project website contains a private section accessible through a valid login. The private section of the website presents a platform through which private documents can be downloaded, the wiki can be accessed and users can update their personal information. The private section of the website also contains a complete list of the contact details of all PHOSPHORUS members.

1.1.2 Project Wiki

A PHOSPHORUS wiki accessible with a valid login for members of the PHOSPHORUS consortium was developed. Members use the wiki as a platform to members can communicate within each work-package and between work-packages. Each work-package has its own section on the wiki. The wiki includes all official documents prepared within the PHOSPHORUS project including those in progress. It contains links to related projects websites such as BREAD, ePhoton/ONE, MUPBED, EGEE etc, a mailing list and events section detailing events for internal dissemination.
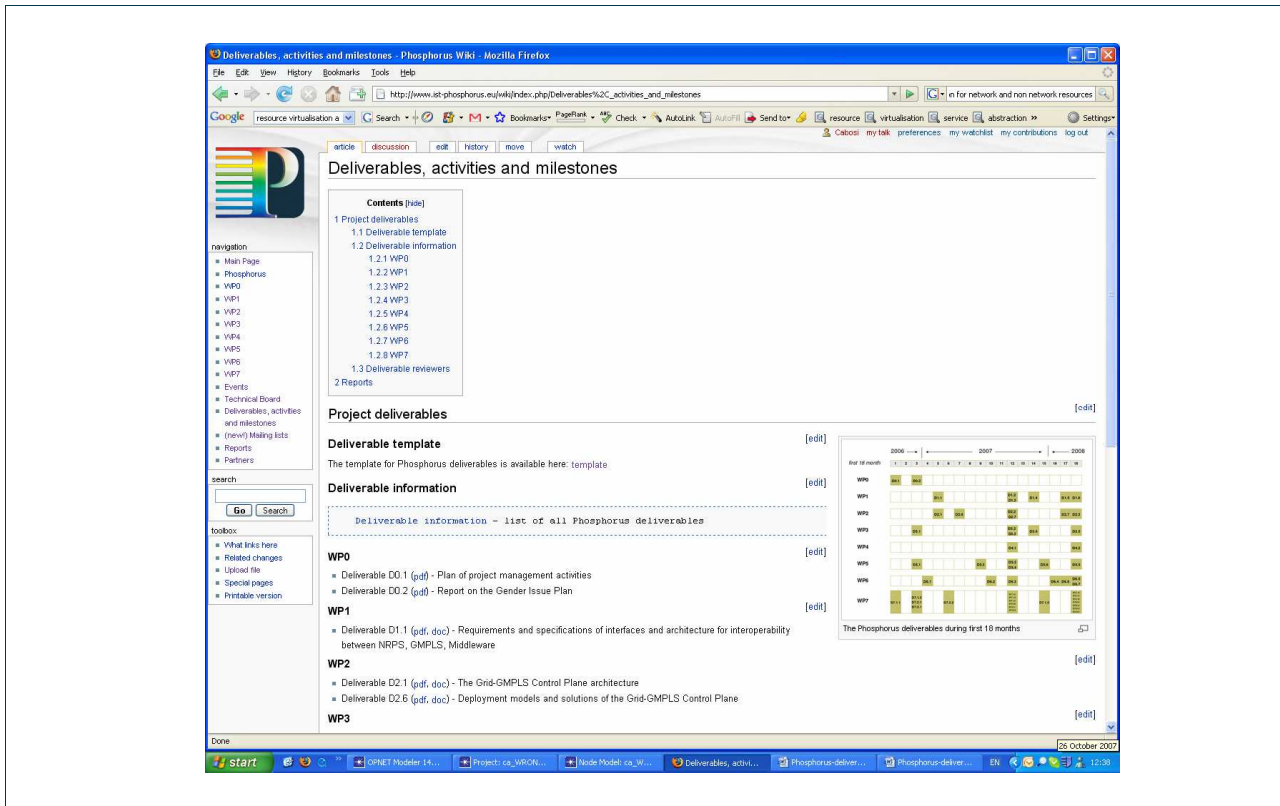
Figure 1-1: Screenshot of the PHOSPHORUS wiki

1.1.3   Project Meetings and Internal Collaborations

The projects progress is highlighted through a series of project meetings. The most important is the Plenary Meeting which was held twice in the past year. In addition to this, each work package organizes a series of teleconferences and physical meetings as they deem necessary. As part of the day-to-day activities, internal dissemination is also carried out via various types of electronic communication.

Figure 1-2: 2nd Plenary Meeting in Poland

1.1.4   Mailing List

A mailing list for all work packages and for administrative purposes has also been established to support efficient internal communication. The list is accessible through the project wiki and has been in use since the start of the project.

2 Major External Dissemination Activities

2.1 Information Material

2.1.1 Project Website

A website was developed to act as a platform for public outputs such as publications, public deliverables, and public standardisation drafts. The website presents a brief summary of the PHOSPHORUS project, all events that have taken place since the start of the project, a news section and a comprehensive contact details list of all partners involved in the project. It provides a forum for members to discuss and liase with relevant research and technical community outside the PHOSPHORUS consortium. It also includes a private section restricted to PHOSPHORUS members permitting collaborations within the group and a link to the official PHOSPHORUS wiki.

The website is continuously being updated and can be accessed through http://www.ist-phosphorus.eu

Figure 2-1: Homepage of the PHOSPHORUS website

2.1.2   Project Poster

An official PHOSPHORUS project wall poster template was prepared and printed by Poznan Supercomputing and Networking Centre (PSNC). It outlines the objectives, architecture, testbed, partners and the projects contact details. A smaller version (B1 format) of the wall poster and a detailed poster is also available. The detailed version of the poster details the collaboration between the EnLIGHTened, G-Lambda and PHOSPHORUS project. It presents the objectives, architecture and brief summary of each project. The posters have been distributed to all members of the PHOSPHORUS consortium for display. The poster is also presented at the events PHOSPHORUS participates in.

2.1.3   Project Presentation Slides

A general presentation that presents an overview of the PHOSPHORUS project and outlines the projects goals and technical objectives was prepared. The presentation has since evolved since its initial version and will continue to evolve with the project. The presentation can be accessed from the public section of the PHOSPHORUS website at http://www.ist-phosphorus.eu/files/press/Phosphorus-general_presentation.pdf

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2.1.4   Project Brochure

A brochure, one page for each work-package, was prepared by PSNC. It presents a detailed summary of the project objectives and the objectives and activities of each work-package.

Figure 2-2: Front and back pages of the PHOSPHORUS brochure

2.1.5   Project Briefcase

A summary of the PHOSPHORUS project, its objectives, technical approach and expected results are outlined in a PHOSPHORUS pamphlet / briefcase prepared by PSNC.

2.1.6   Miscellaneous Information Material

Other information materials prepared by PHOSPHORUS for dissemination include white T-shirts, labels and stickers and sweets with the PHOSPHORUS logo on it.

2.2   Events

This section details the events in which PHOSPHORUS presented booths, presentation stands and exhibitions.

2.2.1   Supercomputing 2006 (SC06)

SC06, is the premier international conference on high performance computing, networking and storage. It explores ways in which high performance computing, networking, storage and analysis lead to advances in research, education and commerce. It was held in Tampa, Florida, USA from the 11th – 17th November 2006.

PHOSPHORUS was represented by SARA and University of Essex.

Summary of Participation

SARA demonstrated TOPS (the application that is used in the PHOSPHORUS testbed under WP3) at SC06. Joint sessions were organised from the Dutch Research Consortium booth and with international partners at the exhibition floor, using lambda networks.

SARA presented the Network Description Language by means of a poster. The PHOSPHORUS goals were explained to visitors at the Dutch Booth, using the PHOSPHORUS poster.

University of Essex organised and chaired a BOF session, GHPN/GLIF: Delivery of Network Services across Heterogeneous Optical Domains, in SC06.

The BOF discussed solutions provided by the three research projects: PHOSPHORUS (EU), EnLIGHTened (US) and G-Lambda (JPN). All three projects are concerned with interoperability issues between heterogeneous network domains. The BOF targeted wider community awareness and participation in the main common technical challenges concerning these projects.

More information on BOF session can be found at
http://sc06.supercomputing.org/schedule/event_detail.php?evid=9389

More information on the Supercomputing 2006 can be obtained online at http://sc06.supercomputing.org

2.2.2   3rd Concertation meeting on e-Infrastructure

The 3rd Concertation Meeting on e-infrastructure was held in Helsinki on 20th November 2006. The objectives of the meeting were threefold:

- to provide an update on the on-going concertation efforts on networks and grids and to discuss the trends and critical issues related to the future of research networking testbeds and to explore creation of synergies between projects
- to explore plans for future actions (in particular, within the context of the upcoming FP7)
- to pursue efforts to maximize synergy with other similar concertation initiatives.

PHOSPHORUS was represented by PSNC.

Summary of Participation
PSNC represented PHOSHPHORUS by presenting both a poster and presentation.

Figure 2-3: 3rd Concertation Meeting on e-Infrastructure

More information on the 3rd Concertation meeting on e-Infrastructure can be obtained online at
http://www.panlab.net/news/view/article/3rd-concertation-meeting-on-e-infrastructure.html

2.2.3   OptiPuter all Hands Meeting and Open House 2007

The OptIPuter, stands for **Opt**ical networking, **I**nternet **P**rotocol, comp**uter** storage, processing and visualization technologies. Its vision is to develop an infrastructure that will tightly couple computational resources over parallel optical networks using the IP communication mechanism, with optical networks creating "supernetworks". The new architecture will enable scientists who generate terabytes and petabytes of data to interactively visualize, analyze, and correlate their data from multiple storage sites connected to optical networks. The all hands meeting and open house were held in California USA from January 21 - 23, 2007.

PHOSPHORUS was represented by SARA and University of Amsterdam

Summary of Participation
SARA and University of Amsterdam represented PHOSPHORUS with presentations on Network Description Language.

SARA represented PHOSPHORUS by Private communication to OptIPuter partners and a demo of 4K streaming from Amsterdam to San Diego using TOPS.

More information on the OptiPuter all Hands Meeting and Open House can be obtained online at
http://www.optiputer.net/events/presentation_temp.php?id=26

2.2.4   Workshop on 4K digital Cinema Streaming over Lightpaths

A workshop was organized on 4K digital Cinema Streaming over Lightpaths, using TOPS. The workshop took place in Amsterdam, Netherlands on February 14, 2007.

PHOSPHORUS was represented by SARA.

Summary of Participation
SARA built the first 4K visualization setup on which highly detailed movies can be shown using TOPS. SARA has recently demonstrated this facility to the early adopters of 4K cinema in the Netherlands. SARA represented PHOSPHORUS with presentations and a demo on Tiled Panel with TOPS.

More information can be found online at
http://www.sara.nl/news/press/20070214/4K_dig_cinematechniek_eng.html

2.2.5   TERENA's European Future Networking Initiatives Workshop 2007

The objective of the workshop is to exchange information and raise awareness about the many discussions and initiatives world-wide to develop a new, 'clean slate' architecture for the Internet, and to discuss how the

European research networking community will want to participate in these developments. The workshop took place on 22 February in Amsterdam.

PHOSPHORUS was represented at TERENA's European Future Networking Initiatives Workshop 2007 by I2CAT

Summary of Participation
I2CAT represented PHOSPHORUS by holding a booth and presentation stand.

More information on the workshop can be obtained online at http://www.terena.org/activities/efniw/

2.2.6   Internet2 Meeting

The Internet2 meeting took place on 23-25 April at Arlington, Virginia, USA.

PHOSPHORUS was represented at Internet2 by PSNC.

Summary of Participation
PSNC presented the PHOSPHORUS project using the PHOSPHORUS official slides.

More information on the Internet2 Meeting can be obtained online at http://events.internet2.edu/2007/spring-mm/

2.2.7   High Performance Visualization meeting

PHOSPHORUS was represented at the High Performance Visualisation meeting by SARA.

Summary of Participation
SARA demonstrated TOPS to Dutch Scientists.

More information on the High performance visualisation meeting can be obtained online at http://www.sara.nl

2.2.8   Nortel Workshop

PHOSPHORUS was represented at the High Performance Visualisation meeting by SARA.

Summary of Participation
SARA presented on TOPS, lightpath monitoring and DRAC.

More information on the Nortel Workshop can be obtained online at http://www.sara.nl

2.2.9 CineGrid Holland Festival Amsterdam

The CineGrid Holland Festival Amsterdam was held on June 20, 2007. The CineGrid festival demonstrated the first successful trans-Atlantic streaming over photonics IP networks. The demonstration showed very high quality digital media running over very high speed digital networks.

PHOSPHORUS was represented at the High Performance Visualisation meeting by SARA.

Summary of Participation
SARA contributed to "the making of" as part of "Era la Notte" live 4K cinema streaming to USA, Japan, Europe.

More information on the CineGrid Holland Festival can be obtained online at http://www.cinegrid.nl, and http://www.youtube.com/watch?v=moL2tl0mIkw

2.2.10 TERENA NRENs and GRID Workshop

TERENA NRENs and GRID workshop brings together researchers from academia and industry involved in Grid projects to discuss and evaluate the implications of Grid Services on network provisioning. The workshop, through the discussions, aims to highlight common issues for these communities and to seek agreements and recommendations. The conference took place on 6th – 7th December 2006 in Amsterdam, Netherlands and 11-12th June 2007 in Paris, France

FHG were representatives from PHOSPHORUS at the workshop in both the December 2006 and June 2006 sessions.

More information on the TERENA NRENs and GRID workshop can be obtained online at http://www.terena.org/activities/nrens-n-grids/

2.2.11 International Supercomputing Conference'07 (ISC'07)

The ISC brings together world renowned speakers from industry and academia to share their experiences and visions and to discuss issues trends and results that are poised to shape the future of high performance computing and networking. In 2007, the conference took place on 26 – 29 June 2007 in Dresden Germany.

PHOSPHORUS was represented at SC'07 by PSNC and FHG.

Summary of Participation
PSNC represented PHOSPHORUS by presenting a poster at this event.

FHG represented PHOSPHORUS by organising a BoF session on Service Level Agreements for resource management and presenting the PHOSPHORUS MetaScheduling Service developments at this event.

More information on the International Supercomputing Conference, '07 can be obtained online at http://www.supercomp.de/isc2007/

2.2.12 European Conference and Exhibition on Optical Communication'07 (ECOC'07)

ECOC is the largest conference on optical communication in Europe, and one of the most respected and long-standing events of its kind in the world. ECOC is already into its 32nd edition, signifying the stability and attractiveness of this conference as one of the world's recurring major events, providing the forum for leading developments and results in optical communication and networks.

PHOSPHORUS was represented at ECOC'07 by PSNC, University of Essex, Ghent University-IBBT, and AIT (Athens Information Technology)

Summary of Participation
PSNC represented PHOSPHORUS at ECOC'07 by providing the PHOSPHORUS booth with posters, folders, leaflets and sweets with PHOSPHORUS logo on them.

University of Essex, Ghent University-IBBT and Athens Information Technology collaborated to co-organise a workshop at ECOC'07. The workshop, "Networks for IT: A new opportunity for optical network technologies" was co-organised with e-Photon-One. It was chaired by Dimitra Simeonidou (dsimeo@essex.ac.uk) of University of Essex. Co-chairs for the event were Mario Pickavet (mario.pickavet@intec.ugent.be), Ghent University – IBBT, Anna Tzanakaki, (atza@ait.edu.gr), Athens Information Technology and Ioannis Tomkos, (itomkos@ait.edu.gr), Athens Information Technology.

The workshops stemmed from the well known realization that networks increasingly deal with managing and adapting distributed computing and associated data management resources (PCs, servers, supercomputers, clusters) and storage systems. Due to potentially very high aggregated demands for networked IT, a paradigm shift in the optical network architecture may be needed to enable dynamic and distributed IT services at large scale. This workshop offered a unique opportunity for optical network researchers and practitioners to exchange ideas and experiences on problems, challenges, solutions and future research and development issues concerning the deployment of optical networks for providing IT services. In addition to invited paper presentations, the workshop provided an intimate setting for discussion and debate.

Figure 2-4 PHOSPHORUS presence at ECOC07

The agenda and a summary of the workshop can be found in a special section on the PHOSPHORUS website at http://www.ist-phosphorus.eu/event_03.php

More information on the Network for IT workshop at ECOC'07 can be obtained online at http://www.vde.com/Conferences_en/ECOC+2007/Workshops/

More information on ECOC'07 can be obtained online at http://www.ecocexhibition.com/modules/serve.cgi

2.2.13 Global Lambdagrid Workshop (GLIF'07)

Established in Iceland in 2003, GLIF, the Global Lambda Integrated Facility, is an international virtual organisation that promotes the paradigm of lambda networking. Its participants include National Research and Education Networks (NRENs), consortia and institutions working with lambdas. Each year, it organises a LamdaGrid workshop as a platform for engineers, managers, researchers and developers to share experiences and discuss issues related to optical networking. This year, it was held in Prague, Czech Republic on 17-18 September 2007.

PHOSPHORUS was represented at GLIF'07 by PSNC and SARA.

Summary of Participation

PSNC represented PHOSPHORUS at GLIF'07 by providing the PHOSPHORUS presentation stand with posters, folders, leaflets and sweets with PHOSPHORUS logo on them.

PSNC represented PHOSPHORUS at GLIF'07 by providing a demo of 4K streaming from Amsterdam to Prague and another demo of International High Performance Digital Media with Optical Multicast.
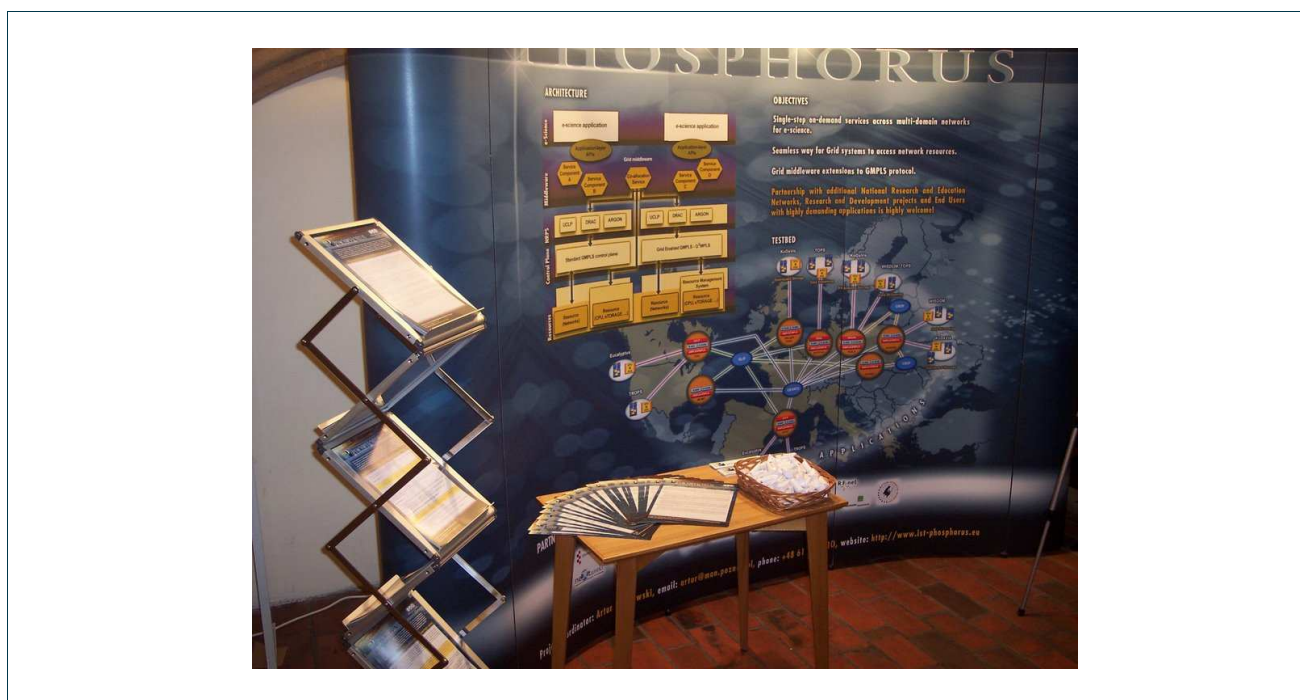
Figure 2-5: PHOSPHORUS booth at GLIF07

More information on GLIF'07 can be obtained online at http://www.ces.net/glif2007/ and http://www.glif.is

2.2.14 CEF Network Workshop (CEF'07)

The CEF Workshop recognizes the growing discipline of the Customer Empowered Networks and provides a platform for the exchange of experience and to support further effort in deployment of the Customer Empowered Networks concept. This year, it was held in Prague, Czech Republic on 19-20 September 2007.

PHOSPHORUS was represented at CEF'07 by PSNC.

Summary of Participation

PSNC represented PHOSPHORUS at CEF'07 by providing the PHOSPHORUS presentation stand with posters, folders, leaflets and sweets with PHOSPHORUS logo on them.

More information on CEF'07 can be obtained online at http://www.ces.net/doc/seminars/cef2007/

2.2.15 3rd Technical Meeting on Remote Instrumentation in Next–generation Grids (IMEKO'07)

The 3rd Technical Meeting on Remote Instrumentation in Next–generation Grids (IMEKO'07) was held in Iasi, Romania on 20 - 21 September 2007.

PHOSPHORUS was represented at IMEKO'07 by PSNC.

Summary of Participation
PSNC represented PHOSPHORUS at IMEKO'07 by providing the presentation posters, folders, and leaflets.

More information on IMEKO'07 can be obtained online at http://www.imeko2007.ee.tuiasi.ro/

2.3   **Workshops and Meetings**

2.3.1   **Collaboration of Three Continents Meeting**

G-Lambda, PHOSPHORUS and EnLIGHTened Computing research teams met together to formulate an action plan for collaboration of optical networks and grid middleware across three continents. The collaboration was hosted by MCNC and was attended by videoconference by NSF in Washington DC; Bonn, Germany; Barcelona Spain and Pisa, Italy. The conference took place at Research Triangle Park, USA, from 31 January – 2 February 2007 and there the PHOSPHORUS project provided the following list of presentations:

- A Binczewski "PHOSPHORUS Introduction and Strategy" Presentation, **PSNC**
- M Garstka "Overview of PHOSPHORUS Testbeds and Grid Resources", Presentation, **PSNC**

More information can be found at http://www.mcnc.org/events/continentalcollaboration/

2.3.2   **GLIF meeting and Internet2 Joint Tech**

Established in Iceland in 2003, GLIF, the Global Lambda Integrated Facility, is an international virtual organisation that promotes the paradigm of lambda networking. Its participants include National Research and Education Networks (NRENs), consortia and institutions working with lambdas. Each year, it organises a LamdaGrid workshop as a platform for engineers, managers, researchers and developers to share experiences and discuss issues related to optical networking. The winter working group meeting took place from 14 – 15 February 2007 in Minnesota, USA with PHOSPHORUS represented with the following presentation:

- R. van der Pol, "Lightpath monitoring in NetherLight" Presentation, **SARA**

More information can be found http://www.glif.is/meetings/2007/winter/

2.3.3 Jülich - Karlsruhe Colloquium on Grid Computing

PHOSPHORUS was represented at the Jülich - Karlsruhe Colloquium on Grid Computing by giving a presentation on the 22nd of May 2007. The presentation was given by the following partners:

- T. Eickermann, "Network Research and Provisioning - Current and future projects of ZAM", Presentation, **FZJ**

2.3.4 IEEE Workshop on Policies for Distributed Systems and Networks (POLICY 2007)

Established in 1999, the POLICY series of workshops that present a stage for leading researchers and industry experts to get together and discuss problems, solutions and experiences in developing policy-based systems. In 2007, the workshop focused on the Semantic web and the effect of applying semantic web policy frameworks to various applications. The conference took place in Bologna, Italy, from 13-15 June 2007. PHOSPHORUS was represented with:

- Y. Demchenko, L. Gommans, C. de Laat, "Using SAML and XACML for Complex Resource Provisioning in Grid based Applications", Paper, **UvA**.

More information can be found at http://lia.deis.unibo.it/confs/policy2007/

2.3.5 First International Workshop on GRID over Optical Burst Switching Networks (GOBS2007)

Grids offer a uniform interface to a distributed collection of heterogeneous computational, storage and network resources. Optical burst switching enables these features while offering the necessary network flexibility demanded by future Grid applications. The first GOBS workshop was held in 2007 and brought together practitioners and researchers for discussion and work on further development, deployment and validation of Grid applications. In addition work on the emerging aspects pertaining to advanced techniques, platforms, paradigms, theories, and techniques for designing and deployment of Grid over optical burst switching networks was discussed. The conference took place in Athens, Greece, from 19 - 25 June 2007 as part of the ICNS2007 with the following paper by PHOSPHORUS:

- G. Zervas, R. Nejabati, D. Simeonidou, "Grid-empowered Optical Burst Switched Network: Architecture, Protocols and Testbed", Paper, **University of Essex**.
- M. De Leenheer, C. Develder, F. De Turck, B. Dhoedt, P. Demeester, "Erlang Reduced Load Model for Optical Burst Switched Grids", Paper, **IBBT**.
  The paper can be accessed from http://users.atlantis.ugent.be/mdleenhe/pdf/erlang-gobs0z7.pdf

More information on GOBS 2007 be found at http://www.iaria.org/conferences2007/GOBS.html

2.3.6   2nd OpenNet Workshop

The 2nd OpenNet Workshop took place in Nice, Frace, on July 4th, 2007. Its main purpose was to initiate and steer a discussion on the opportunity to federate a number of test-beds from running or completed EU-funded projects (mainly from FP6), around a number of agreed research topics. The workshop was centred on a two level set of presentations and following discussion:

- Research topics targeted by a number of EU-funded projects (among others: OpenNet, NetQoS, EuQoS, PHOSPHORUS)
- Research test-bed and experimental platforms available, and opportunity and challenges in their clustering.

PHOSPHORUS was represented by the following paper:
- N. Ciulli, G. Carrozzo, "PHOSPHORUS: introduction and considerations on test-beds federation", Paper, **Nextworks**

Details of the workshop can be seen at http://www.ist-opennet.eu/events.php?idevent=6.

2.3.7   CoreGRID Symposium

The CoreGRID Symposium aims at being the premiere European event on Grid Computing for the dissemination of the results from European and member states initiatives as well as other international projects in Grid research and technologies. It is organized jointly with the Euro-Par 2007 conference. The CoreGRID Symposium will focus on all aspects of Grid computing including service infrastructures and as such will bring together participants from Research and Industry. The conference took place in Rennes, France, from August 27 - 28 2007.

PHOSPHORUS was represented by contributing two papers. One paper is part of the CoreGRID Series, "Towards Next Generation Grids". The other was for the CoreGRID Workshop on Grid Programming Model, Grid and P2P Systems Architecture, Grid Systems, Tools and Environments. They were contributed by the following partners.

- C Barz, M Pilz, O. Wäldrich, W. Ziegler, T. Eickermann, L. Westphal, " Co-Allocating Compute and Network Resources - Bandwidth on Demand in the VIOLA Testbed", Paper, **University of Bonn, SCAI/FHG**, **FZJ**
- P Kokkinos, E Varvarigos, "Resources Configurations for providing Quality of Service in Grid Computing", Paper, **RACTI**.

Details of the conference can be found at http://www.coregrid.net/

2.3.8   GLIF Technical Working Group Meeting (GLIF'07)

Established in Iceland in 2003, GLIF, the Global Lambda Integrated Facility, is an international virtual organisation that promotes the paradigm of lambda networking. Its participants include National Research and Education Networks (NRENs), consortia and institutions working with lambdas. Each year, it organises a LamdaGrid workshop as a platform for engineers, managers, researchers and developers to share experiences and discuss issues related to optical networking. This year the GLIF technical working group meeting

workshop, it was held in Prague, Czech Republic on 17-18 September 2007. PHOSPHORUS was represented by giving the following presentations:

- Artur Binczewski, "The infrastructure of the PHOSPHORUS project", Presentation, **PSNC**
- R. van der Pol "TL1-Toolkit", Presentation, **SARA**.

- R. van der Pol "Interdomain Monitoring Requirements", Presentation,**SARA.**
- R. van der Pol "Experiences with the ordering and fault resolution process for multi-domain Lightpaths across hybrid networks", Presentation,**SARA**.
- L. Gommas, "GMPLS token mechanisms" Presentation **UvA**
- I. Monga, B. Peeters, "PHOSPHORUS and Dragon methods of interdomain path setup" Presentation **Nortel, SURFnet**

Open discussions about networks control planes architectures in different projects from Europe, North America and Asia were the very interesting part of GLIF meeting.

More information on GLIF'07 can be obtained online at http://www.ces.net/glif2007/ and http://www.glif.is

2.3.9   CEF Network Workshop (CEF'07)

The CEF Workshop recognizes the growing discipline of the Customer Empowered Networks and provides a platform for the exchange of experience and to support further effort in deployment of the Customer Empowered Networks concept. This year, it was held in Prague, Czech Republic on 19-20 September 2007. PHOSPHORUS was represented at CEF'07 with:

- R. van der Pol, "Lightpaths monitoring in SURFnet6 and NetherLight" Presentation **SARA**
- R. van der Pol, A. Toonk, "Lightpath Planning and Monitoring Tool", Poster **SARA**

More information on CEF'07 can be obtained online at http://www.ces.net/doc/seminars/cef2007/

2.4   Conferences

2.4.1   International Conference on Optical Burst/Packet Switched Networks (WOBS06)

Since 2003, the International Workshop for Optical Burst Switching (WOBS) has been an event bringing together leading researchers in Optical Burst and Packet Switching and related technologies. It provides a forum to address and fostering the exchange and discussion of ideas and visions related to design, implementation and application issues. It thus contributes to the advancement, development and awareness of OBS within the telecommunication and networking industry as a practical architecture for next-generation of optical networks.

The conference took place at San Jose, USA, on October 2, 2006 and the PHOSPHORUS project provided the paper:

- D. Simeonidou, G. Zervas, R. Nejabati "Design considerations for photonic routers supporting application-driven bandwidth reservations at sub-wavelength granularity" <u>Paper</u>, **University of Essex**

More information can be found at http://www.obsmeeting.org/2006/cfp.shtml

2.4.2   IEEE/IFIP International Workshop on Autonomic Grid Networking and Management (AGNM2006)

AGNM 2006 was a one-day workshop that offered a unique opportunity for researchers and practitioners to exchange ideas and experiences on problems, challenges, solutions and potential future research and development issues in this new field of Autonomic Grid Networking and Management. In addition to paper presentations, the workshop provided an intimate setting for discussion and debate through panels and group work. The conference took place in Dublin Ireland, from 26 – 27 October 2006.

The PHOSPHORUS project provided the following paper.

- N Ciulli, G Carrozzo, "Making sense of Grid on IP Control Plane" <u>Paper</u>, **Nextworks**

Summary on the Outcome of the Workshop
The presentation was carried out in the panel of Technical Session 5 "Making sense of Grid on IP Control Plane"). The panel was chaired by Wayne Clark (Cisco Systems), and was organized as a debate among three different points of view about the main statement: *"do we really need a Control Plane for Grid applications"*?

The three panelists were selected in order to express different viewpoints with respect to that statement:
Nicola Ciulli (Nextworks) expressed a strong positive position in favour of the need of an evolved, intelligent Control Plane to make Grid services manageable and operational for research and commercial services;
Michael Welzl (University of Innsbruck) positioned at the very opposite end and stated that, with a number of assumptions (e.g. overprovisioning of transport plane resources) networks can support any advanced service or application (e.g. Grids) without the need of any intelligence for dynamic service provisioning;
Rama Ati (Cisco Systems) tried to support an intermediate point of view, and provided an insight of current related activities in Cisco, which were very much in line with Control Plane architectures and modules.

The three panel presentation generated a very lively discussion soon after, which extended for nearly 1 hour, up to the end of the session (which coincided with the overall end of AGNM'06); in other words, the discussion had to be closed mainly due to time limits.

A very large part of the audience (20+ people) intervened in the discussion and expressed their positions, most of which agreed that some form of Control Plane intelligence is actually needed for any kind of application service, and Grids in particular. The positions diverged on the role and "power" to be attributed to the Control Plane: either an overall controller/enabler of any transaction involved in the specific application (some even introduced the extreme idea of a "Peer-to-peer GMPLS" beyond the "Grid-GMPLS" in PHOSPHORUS), or just a controller of the transport network resources involved.

More information can be found at http://www.manweek2006.org/agnm/agnm.php

2.4.3 Optical Fibre Communication Conference and Exposition and the National Fibre Optic Engineers Conference (OFC/NFOEC07)

OFC/NFOEC is the largest conference and exhibition event in the Optical Communications and Networking community. It brings together international experts from industry and academia to discuss and demonstrate their research activities and ideas. It includes live demonstrations, interactive displays, news in the making and the opportunity to talk to the experts. The conference took place from 25 - 29 March 2007 in Anaheim, California, USA. PHOSPHORUS was represented by the following with:

- G Zervas, R Nejabati, Z Wang, D Simeonidou, S Yu, M O'Mahony, "A Fully Functional Application-Aware Optical Burst Switched Network Test-Bed" Paper, **University of Essex**
- D Simeonidou, R Nejabati, G Zervas "Optical Networks Supporting IT Services" Presentation, **University of Essex**

More information can be found at http://www.ofcnfoec.org/about_ofc/Archive/OFC_NFOEC_2007.aspx and http://cse.buffallo.edu/~qiao/workshop/FON2/

2.4.4 The Second International Conference on Availability, Reliability and Security (ARES 2007)

The objective of the Second International Conference on Availability, Reliability and Security (ARES 2007) is to provide a platform for researches to discuss issues of dependability as an integrative concept that covers amongst others availability, safety, confidentiality, integrity, maintainability and security in the different fields of applications. It also provides a facility for the researchers to critically research and examine the challenges of the various aspects of Dependable Computing and the definition of a future road map.

The conference took place from 10-13 April 2007 in Vienna, Austria. With representation by PHOSPHORUS:

- Y. Demchenko, L. Gommans, C. de Laat, "Using SAML and XACML for Complex Authorisation Scenarios in Dynamic Resource Provisioning" Paper, **UvA**

More information can be found at http://www.ares-conference.eu/

2.4.5 German E-Science Conference (GES2007)

The German national e-Science framework is a German Ministry of Education and Research funded framework. It aims to provide coordination and collaboration between different research areas which are involved and interested in e-Science. It creates a forum, the German e-Science Conference (GES), for partners of the German e-Science community to present their results on Grid computing, knowledge networking, e-Learning and open access. GES achieves this through a series of talks, posters and by demos. GES 2007 was held from 2 – 4 May 2007 in Baden-Baden Germany with the following paper published by PHOSPHORUS:

- Riedel, M.; Frings, W.; Dominiczak, S.; Eickermann, T.; Düssel, T.; Gibbon, P.; Mallmann, D.; Wolf F.; Schiffmann, W. "Requirements and Design of a Collaborative Online Visualization and Steering Framework for Grid and e-Science infrastructures" Paper **FZJ**

- T. Eickermann, W. Frings, O.Wäldrich, P. Wieder, W. Ziegler, "Co-allocation of MPI Jobs with the VIOLA Grid MetaScheduling Framework" Paper, **FHG**

More information can be found at http://www.ges2007.de/papers/

2.4.6 IEEE International Symposium on Cluster Computing and the Grid (CCGrid '07)

The CCGrid series of conference has been part of the effort in the realization of Grid Computing and its promise to deliver unprecedented levels of parallelism to high-performance applications by crossing administrative boundaries. The CCGrid Symposia acts as a platform to bring together researchers and practitioners. It enables them to share their insight, results, and experience in the multi-faceted areas of Grid and Cluster computing. CCGRID2007 was the first of the series to be held in South America and took place in Rio de Janeiro, Brazil from 14 – 17 May 2007 with the following paper published by PHOSPHORUS

- Michael Oikonomakos, Kostas Christodoulopoulos, Emmanouel Varvarigos, "Profiling Computation Jobs in Grid Systems" Paper, **RACTI**

More information can be found at http://ccgrid07.lncc.br/

2.4.7 IFIP - International Conference on Networking 2007

Networking 2007 is one of the conferences sponsored by the IFIP Technical Committee on Communication Systems. Networking 2007 aimed at providing a platform for researchers and industry experts to discuss recent advances in the broad and fast-evolving field of telecommunications. It accomplished this by means of series of technical sessions, keynote talks and tutorials offered by invited experts. It aimed to also highlight key-issues, identify trends and refresh vision in the field of telecommunications.

IFIP 2007 conference took place from 14 – 18 May 2007 in Atlanta, GA, USA. The following paper was presented by PHOSPHORUS

- M. Cristea, L. Gommans, L. Xu, H. Bos, " The Token Based Switch: Per-Packet Access Authorisation to Optical Shortcuts" Paper **UvA**

More information can be found at http://www.ifip-networking.org/

2.4.8 TERENA Networking Conference 2007

The TERENA Networking Conference is the EU organization in the forefront of Internet development. TERENA brings together NRENs from across Europe to exchange information between themselves and with representatives from industry, academia, research institutions and the government. The TERENA Networking Conference 2007 was held in Lyngby, Denmark from May 21-24, 2007. PHOSPHORUS was represented at TERENA Networking Conference 2007 by the following presentations:

- R. van der Pol, "Lightpaths monitoring in SURFnet6 and NetherLight" Presentation, **SARA**.
- R. van der Pol, A. Toonk, "Lightpath Planning and Monitoring Tool", Poster, **SARA**.

More information on the Terena 2007 can be obtained online at http://tnc2007.terena.org/

2.4.9 Optical Networks Design and Modelling (ONDM2007)

The ONDM conference is a series of conference that covers all aspects of optical networking. In particular it covers the recent advanced in the design, modeling and implementation. It brings together invited experts from industry and academia from around the world to present and discuss their view and research work. The conference took place in Athens, Greece, from 29 - 31 May 2007. The following papers from PHOSPHORUS:

- K. Christodoulopoulos, M. Varvarigos, C. Develder, M. De Leenheer, B. Dhoedt, "Job Demand Models for Optical Grid Research", Paper, **RACTI, IBBT**
  The paper can be accessed from http://users.atlantis.ugent.be/mdleenhe/pdf/jobdemands-ondm07.pdf
- G. Markidis, S. Sygletos, A. Tzanakaki, I. Tomkos, "Job Impairment Aware based Routing and Wavelength Assignment in Transparent Long Haul Networks", Paper, **AIT**

More information can be found at http://www.ondm2007.gr/pdf/Program.pdf

2.4.10 RELARN 2007

The RELARN 2007 conference took place from 6 – 9 June 2007 in Nizhny Novgorod – Moscow. PHOSPHORUS was represented by the following partner.

- Y. Demchenko, K. Wierenga, "Modern Technologies of the Federated Access to Research and Education Networks (Russian) ("Современные Технологии Федеративного Доступа к Ресурсам Научных и Университетских Сетей")", Paper, **UvA**

More information can be found at http://www.relarn.ru/conf/conf2007/list_tez.html

2.4.11 International Conference on Networking and Services (ICNS2007)

The International Conference on Networking and Services is a series of conferences that covers fundamentals on networking and services, and highlights new challenging industrial and research topics. These topics include Ubiquitous services, GRID networks and service and next generation networks. The ICNS2007 was held in June from the 19th – 25th in Athens, Greece. The paper was presented by PHOSPHORUS:

- K. Christodoulopoulos, V. Gkamas, E. Varvarigos, "Delay Components of Job Processing in a Grid: Statistical Analysis and Modelling", Paper, **RACTI**

More information can be found at http://www.iaria.org/conferences2007/ICNS07.html

2.4.12 The International Conference on the Optical Internet and the Australian Conference on Optical Fibre Technology (COINT-ACOFT2007)

The COIN-ACOFT International conference provides a platform for practitioners and researchers in academia and industry to partake in the discussion and development of physical layer photonic hardware, networking and traffic engineering technologies. COIN-ACOFT2007 was held in Melbourne, Australia from 24-27 June 2007. PHOSPHORUS presented the following paper:

- C. Develder, M. De Leenheer, T. Stevens, B. Dhoedt, F. De Turck, P. Demeester, "Scheduling in Optical Grids: A Dimensioning Point of View", Paper, **IBBT**

More information can be found at http://www.coinacoft2007.com.au/index.php

2.4.13 International Conference on Transparent Optical Networks (ICTON 2007)

Since its inception in 1999, ICTON has been an aggregative element worldwide in the area of Telecommunications. During these nine years the emerging trends in optical networks and next generation services facilitating technologies have been included in the conferences and now ICTON topics cover all fields composing Transparent Networks, from the backbone to distribution/access network up to the End User.

Every year hundreds of leading researchers in the scientific educational and industrial participate in the conference. The scope of the Conference is concentrated on the applications of transparent and all-optical technologies in broadband telecommunication networks, systems and components. The technical areas covered are intended to monitor the technology, theory, and modelling advances within the field with emphasis on optical signal processing for telecommunication applications; review the progress in all-optical switching and routing devices, networking aspects, and traffic engineering and address the convergence of wireless and optical communication technologies for next-generation networks and services. The conference took place in Rome, Italy from 1-5 July 2007 and PHOSHPORUS presented the following paper:

- G. Markidis, A.Tzanakaki, N. Ciulli, G. Carrozzo, D.Simeonidou, R. Nejabati, G. Zervas, "EU Integrated Project PHOSPHORUS: Grid-GMPLS Control Plane for the Support of Grid Network Services", Paper, **AIT, Nextworks, University of Essex**

More information can be found at http://www.itl.waw.pl/konf/icton/2007/invited.html

2.4.14 IEEE International Conference on Broadband Communication, Networks and Systems (BROADNETS2007)

IEEE BROADNETS 2007 is an international conference focusing on broadband communications, networks, and systems. It covers the entire range of next generation networks, communications systems, applications and services including wireless and optical communications, networking and systems as well as theory and algorithms of networking. The conference took place in Raleigh, North Carolina USA, from 10 – 14 September 2007. PHOSPHORUS was represented by:

- M. De Leenheer, C. Develder, B. Dhoedt, M. Pickavet, P. Demeester, "Design and Control of Optical Grid Networks", <u>Paper</u>, **IBBT**.
  The paper can be accessed from http://users.atlantis.ugent.be/mdleenhe/pdf/ogrid-broadnets07.pdf

More information on BROADNETS can be found at http://www.broadnets.org/2007/index.html

2.4.15 European Conference and Exhibition on Optical Communication'07 (ECOC'07)

ECOC is the largest conference on optical communication in Europe, and one of the most respected and long-standing events of its kind in the world. ECOC is already into its 32nd edition, signifying the stability and attractiveness of this conference as one of the world's recurring major events, providing the forum for leading developments and results in optical communication and networks. The conference took place at Berlin, Germany, from 16-20 September 2007 with PHOSPHORUS presence:

- A. Binczewski, "The PHOSPHORUS project - new face of bandwidth on demand services", <u>Presentation</u> **PSNC**.
- C. Develder, M. De Leenheer, B. Dhoedt, "Evaluation of Optical Grid Scheduling Through Dimensioning", <u>Paper,</u> **IBBT**

More information can be found at http://www.ecocexhibition.com/modules/serve.cgi

2.4.16 IEEE Local Computer Networks Conference (LCN2007)

As one of the networking industry's oldest, continuously running conferences. The LCN2007 is the 32nd meeting in the series and focuses on practical, leading-edge applications and research in the area of computer networks. It has an informal, workshop-style atmosphere, offering significant opportunity for international speakers, panellists, and attendees from industry and academia to spend unstructured time together. LCN2007 was held on 16 October 2007 in Dublin, Ireland. PHOSPHORUS was represented by the following partners with:

- C. Barz, P. Martini, M. Pilz, F. Purnhagen, "Experiments on Network Services for the Grid", <u>Paper</u> **University of Bonn**.
- T. Stevens, J. Vermeir, M. De Leenheer, C. Develder, F. De Turck, B. Dhoedt, P. Demeester, "Distributed Service Provisioning Using Stateful Anycast Communications", <u>Paper,</u> **IBBT**.

More information can be found at http://www.ieeelcn.org/

2.4.17 GridNets 2007

This year the GridNets conference was held in Lyon France from 19 – 20 October 2007. The GridNets conference provides a focused and highly interactive forum where researchers and technologists have the opportunity to present and discuss leading research, developments, and future directions in the Grid networking area. PHOSPHORUS was represented by presentations authored by the following partners at GridNets under

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Document Code:	Phosphorus-WP7-D7.1.3

the "Utility Computing enhanced with High Bit Rate networks: Opportunity and Requirements" workshop organized by CARRIOCAS project:

- D. Simeonidou, A. Binczewski, G. Zervas, "The IST PHOSPHORUS project: A new model for integrating applications and transport network resources", <u>Presentation</u> **University of Essex, PSNC**.

More information can be found at http://gridnets.org/2007/

2.5 Journal Papers

The following Journal Papers have been authored by PHOSPHORUS:

- K Christodoulopoulos, V Gkamas, E Varvarigos, "Statistical Analysis and Modeling of Jobs in a Grid Environment", <u>Journal</u> **RACTI**.
  Accepted for publication in Springer Journal of Grid Computing.

3 Other External Dissemination Activities

3.1 References in the Press

During the year, there were two online press releases with explicit reference to the PHOSPHORUS project. Both articles report on the efforts of one of the partners of the PHOSPHORUS project, i2CAT. The articles reflect the developments of i2CAT and its liaison with Alcatel-Lucent and the GLIF project and are listed below:

- The article, "*Alcatel-Lucent completes the international interconnection to the experimental scientific networks of the Foundation i2CAT*" was released on 8th October 2007. It can be found in the online magazine, "The Economist" ("eleconomista.es") and accessed at: http://www.eleconomista.es/empresas-finanzas/noticias/291214/01/70/Alcatel-Lucent-completa-la-interconexion-internacional-a-las-redes-cientificas-experimentales-de-la-Fundacion-i2CAT.html
- "*Alcatel-Lucent extends the capacities of interconnection of i2CAT with GLIF*" was published in the the World Communications online magazine on the 9th of October 2007. (http://www.idg.es/comunicaciones/noticia.asp?id=61048&seccion=telecomunicaciones)

4   Future Dissemination Activities

4.1   Future Advertising Materials

PHOSPHORUS partners will continue to improve and enhance the official information material. The website and wiki is continuously kept updated with current information.

4.2   Future Events and Conferences

This section details events and conferences scheduled to take place in the next year in which PHOSPHORUS participation is confirmed. A full list of all events and conferences that PHOSPHORUS expects to participate in the next year in is listed in [1].

4.2.1.1 OGF21

The Open Grid Forum (OGF) is a community of users, developers, and vendors that aim to accelerate GRID adoption by providing an open forum for grid innovation and developing open standards for grid software interoperability. The OGF is currently leading the global standardization effort for grid computing. The OGF community consists of thousands of individuals in industry and research, representing over 400 organizations in more than 50 countries (http://www.ogf.org/About/abt_overview.php).

PHOSPHORUS will be represented at OGF21. The GRAAP session will be chaired by FHG. FHG will participate in GSA-RG, JSDL-WG, RSS-WG, NML-WG sessions. They will be joined with UvA members at GHPN session. OGF21 will take place on October 15 – 19 2007 in Seattle, USA.

4.2.1.2 APOC 2007

I2CAT and NXW will represent PHOSPHORUS at APOC.

NXW contributed to an invited paper which will be presented.

I2CATexpects to participate at the Asia-Pacific Optical Communications (APOC) which will take place from the 1st – 5th November 2007. Sergi Figuerola has been invited to give a talk about PHOSPHORUS on the scope of "Network Architecture, Management and Applications". APOC is SPIE's primary conference on Optical Communications in Asia and the world's third largest conference in the field of Optical Communications. The

conference will take place in China's Wuhan Optics Valley. More information on the conference can be found at http://wnlo.hust.edu.cn/APOC-2007.htm.

4.2.1.3 *SuperComputing 2007 (SC07)*

PHOSPHORUS will be represented at the Supercomputing 2007 by PSNC, SARA, UvA and I2CAT. The event will take place on November 10-16 in Reno, USA. Further information is available at the events website http://sc07.supercomputing.org/

During the SC07 the PHOSPHORUS project will be presented in PSNC booth. PSNC with other project partners (i2CAT, CRC, SURFNET and FHG) have prepared the demonstrations showing practical results achieved during the first year of the project. It is planned to run two demonstrations, both presenting the usability of the Network Service Plane for the scientists and their applications. The Network Service Plane, which allows interoperability in a seamless environment between different NRPSs, will be verified in an environment composed of UCLP, DRAC and ARGON. The first demonstration is aimed at presenting the KoDaVis application in a distributed environment. The second one will show High Definition video streaming sent across the PHOSPHORUS test-bed.

Demo 1: Distributed application – KoDaVis

Collaborative Data Visualization (KoDaVis) is a distributed, collaborative visualization system with remote access to huge atmospheric simulation data originating from simulations of the transport of chemical tracers in the troposphere. In a collaborative session, two or more visualization clients team up, each connects to the data server, and triggered by user interaction, fragments of the data are sent to all visualization systems on demand.

For the demonstration purposes KoDaVis data server will be located at Forschungszentrum Jülich (Germany) and connected to VIOLA domain. The clients will be located at PSNC and connected to the test-bed. From the laptops located at the SC07 facilities the KoDaVis clients will be managed and controlled using remote desktop software connected to the machines located at PSNC. The following figure presents the demo test-bed:
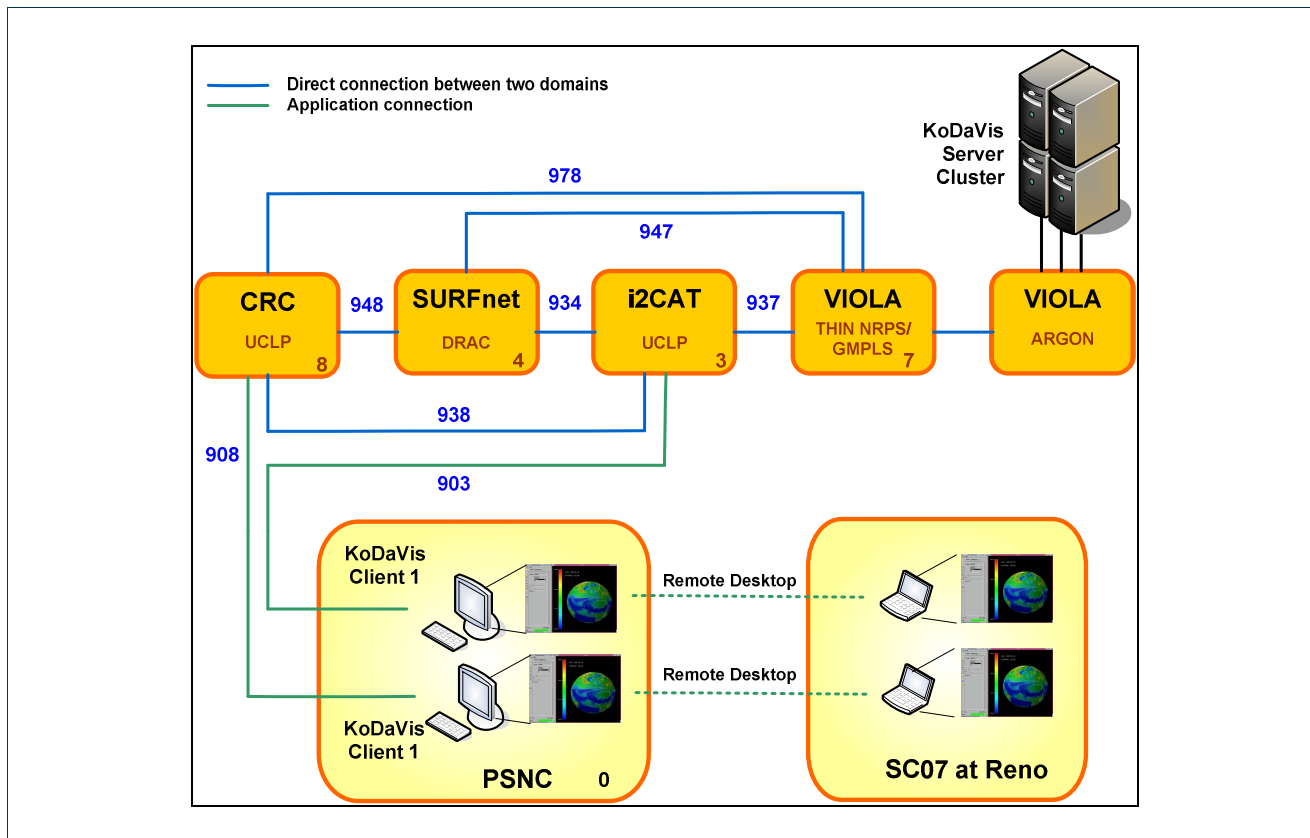
Figure 4-1 PHOSPHORUS testbed at SC07

For reliable visualization sessions, the reservation of bandwidth between the data server and each of the clients is required. The demonstration is aimed at presenting how the Network Service Plane (NSP) manages the paths for the scientific application purposes. During the demo two network reservations will be initiated by the NSP client and KoDaVis will utilize the paths set up by the NSP.

Demo 2: Media application – High Definition video streaming
This demo shows the creation of an end-to-end path to connect the two servers located at PSNC. One of them will send an HD video stream that will cross PHOSPHORUS domains along Europe and Canada. The stream then will be presented on the laptop attached with its 1 Gig NIC to the venue facilities in Reno. The topology of the demonstration test-bed is depicted on the following figure:
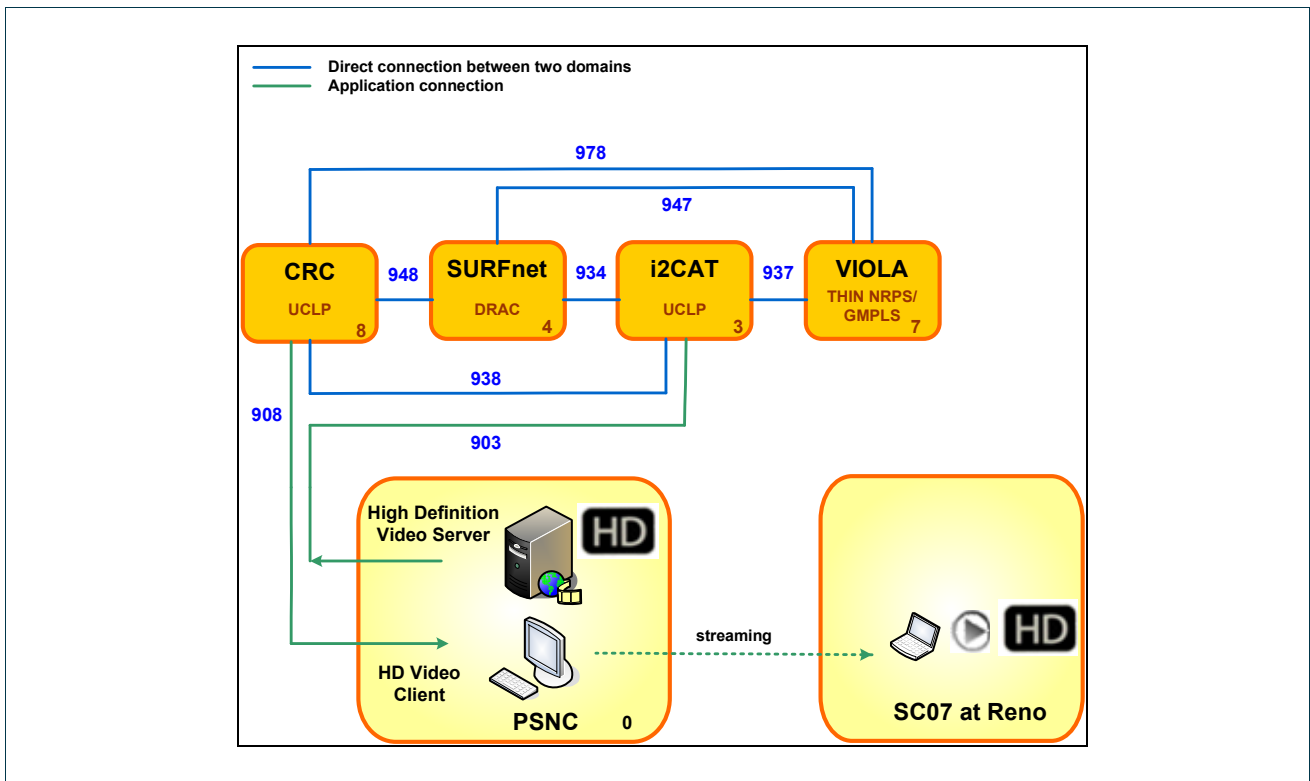
Figure 4-2 Demo testbed topology at SC07

For the demonstration purposes the Network Service Plane will create one end-to-end connection path from CRC to i2CAT. The path computing element can select among different multi-domain paths:

- CRC-VIOLA-SURFNET-i2CAT
- CRC-SURFNET-i2CAT
- CRC-VIOLA-i2CAT

On the server in PSNC we will launch the VideoLAN and we will see at SC07 what is being sent. The demo shows how the multi-domain path is being controlled by the Network Service Plane for the media streaming applications.

4.2.1.4 *TERENA NRENs and GRID workshop*

FHG will participate in the TERENA NRENs and GRID workshop which will take place from 29 – 30 November 2007 in Spain (http://www.terena.org/activities/nrens-n-grids/workshop-06/).

4.2.1.5 *OFC/NFOEC (OFC08)*

An invited paper entitled "A Grid-enabled Control Plane Architecture: The PHOSPHORUS approach" authored by University of Essex, Nextworks and PSNC was submitted to OFC/NFOEC 2008 (http://www.ofcnfoec.org/media_center/ofc_releases/07release10.aspx). The conference will take place on February 24 – 28 in San Diego, USA.

5 Acronyms

APOC	Asia Pacific Optical Communications
ARGON	Allocation and Reservation in Grid-enabled Optical Networks
DRAC	Dynamic Resource Allocation Controller
GRAAP	Grid Resource Allocation Agreement Protocol Working Group
GSA-RG	Grid Scheduling Architecture Research Group
JSDL-WG	Job Submission Description Language Working Group
RSS-WG	Resource Selection Services Working Group
NML-WG	Network Mark-up Language Working Group
NIC	Network Interface Card
NREN	National Research and Education Network
NRPS	Network Resource Provisioning Systems
OFC/NFOEC	Optical Fibre Communication Conference and Exposition and the National Fibre Optic Engineers Conference
OGF	Open Grid Forum
TOPS	Technology for Optical Pixel Streaming
UCLP	User Controlled LightPath

6 **References**

1. C. Abosi, D. Simeonidou, R. Nejabati, D. Parniewicz "PHOSPHORUS deliverable D7.1.2: Plan for Using and Disseminating the Knowledge", Project deliverable, European IST project PHOSPHORUS, Oct. 2007