



## FINAL PLAN FOR USING AND DISSEMINATING KNOWLEDGE

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**Abstract:**

This document presents the terms of use and dissemination of the knowledge arising from the Project and which the Project partners own, in accordance with their interests. The document gives a cumulative overview of the Project's planned and undertaken activities.



**FINAL PLAN FOR USING AND DISSEMINATING  
KNOWLEDGE**

**Document review and moderation**

	Name	Partner	Date	Signature
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## LIST OF ACRONYMS

AGH	University of Mining and Metallurgy - Krakow, Poland
AHM	All-Hands Meeting
BalticGrid-II	BalticGrid Second Phase, EU project starting on 1 <sup>st</sup> May 2008
BG	BalticGrid
CERN	The European Organization for Nuclear Research, Geneva, Switzerland, Project partner
EENet	Estonian Educational and Research Network, Tartu, Estonia, Project partner
EGEE	Enabling Grids for E-science, EU project
EGEE II	Enabling Grids for E-science - second phase, EU project
EGI	European Grid Initiative
EU	European Union
FP	EU Framework Program
HEP	High-Energy Physics
ICFA	International Committee for Future Accelerators
IMCS UL	Institute of Mathematics and Computer Science, University of Latvia, Riga, Latvia, Project partner
IFJPAN	Institute of Nuclear Physics, Polish Academy of Sciences, Krakow, Poland, Project partner
ITPA	Vilnius University Institute of Theoretical Physics and Astronomy, Lithuania, Project partner
JRA	Joint Research Activity 1: Service Level Agreement Markets and Dynamic Account Management
KTH	Royal Institute of Technology, Stockholm, Sweden, Project partner
LAS	Lithuanian Academy of Science
LCG	LHC Computing Grid
LHC	Large Hadron Collider experiment
LHCb	Large Hadron Collider beauty experiment
MD	Migrating Desktop
MPI	Message Passing Interface
NA2	Networking Activity 2: Education, Training, Dissemination and Outreach
NA3	Networking Activity 3: Application Identification and Support
NICPB	National Institute of Chemical Physics and Biophysics, Tallinn, Estonia, Project partner
NREN	National Research and Educational Network
OCM-G	Grid enabled OMIS Compliant Monitoring
OGF	Open Grid Forum
PMB	Project Management Board



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PSNC	Poznan Supercomputing and Networking Center, Poznan, Poland, Project partner
RTU	Riga Technical University, Riga, Latvia, Project partner
SA1	Specific Service Activity 1: Grid Operations
SICS	Swedish Institute of Computer Science
SIG	Special Interest Group
SLA	Service Level Agreement
UF	User Forum
VO	Virtual Organization
VU	Vilnius University, Vilnius, Lithuania, Project partner
VUS	Virtual User System
WLCG	World LHC Computing Grid



## **1. PURPOSE OF THE DOCUMENT**

The objective of this document is to set out in a detailed and verifiable manner, the terms of use and dissemination of the knowledge arising from the BalticGrid project, owned by its partners, in accordance with their interests. It was an evolving document and has been regularly updated to give a cumulative overview of the Project's planned and undertaken activities.

The final plan for using and disseminating the knowledge provides a complete picture of all activities undertaken during the Project, but also it provides information on the future route to full use (exploitation or use in further research) and dissemination of the knowledge.



## 2. EXPLOITABLE KNOWLEDGE AND ITS USE

### 2.1. OVERVIEW TABLE

Exploitable Knowledge (description)	Exploitable product(s) or measure(s)	Sector(s) of application	Timetable for commercial use	Patents or other IPR protection	Owner & Other Partner(s) involved
1. Integration of Tycoon market based Grid system with gLite.	Market based Grid	1. Academic research. 2. Any other BalticGrid user community.	2008	N/A	KTH, PSNC (result is Open Source)
2. Integration of Migrating Desktop with BalticGrid Applications.	Migrating Desktop Platform	1. BalticGrid user community. 2. Non-BalticGrid users.	N/A	N/A	PSNC and all BalticGrid participants.
3. Integration of Virtual User System with gLite.	Virtual User System for gLite	1. BalticGrid user community. 2. gLite users' communities (e.g. EGEE II).	N/A	N/A	PSNC, KTH. (result is Open Source)
4. Integration of rping and IPPM Grid monitoring tools	Grid monitoring system	1. Academic research. 2. Any other BalticGrid user community.	2008	N/A	IMCS UL (composed from Open Source components)
5. Service Level Agreement template with explanations	SLA template	1. Academic research. 2. Any other BalticGrid user community.	2008	N/A	IMCS UL
6. EGEE compatible Tier-3 computing center	Computing equipment with LCG middleware.	1. Science, any research area. 2. High Energy	N/A	N/A	IFJPAN



		Physics.			
7. Distributed physics analysis	Grid interface and experimental software for HEP.	1.Science, any research area. 2. High Energy Physics.	N/A	N/A	IFJPAN
8. Grid Infrastructure for Trainings	Grid Tutorials	1. Academic research. 2. Industry.	N/A	N/A	IFJPAN, EENET, NICPB, ITPA

## 2.2. DESCRIPTION OF EXPLOITABLE KNOWLEDGE

1. **The Market Based Grid** enables a provisioning of resources depending on demand and supply. The system is developed by KTH and PSNC. The result has the potential to be included in the gLite distribution. If an efficient integration is achieved and the implementation and functionality is well received by the BalticGrid users the Tycoon enabled Grid has a potential to become standard in other gLite based grids. The Tycoon system is originating from HP-Labs and the gLite middleware stack from the EGEE project. Both are Open Source distributions and as such freely available to be used in accordance with the different licenses attached.
2. **Migrating Desktop (MD)** is a ready-to-use graphical framework for Grid users and Grid application developers. The role of PSNC is to offer the know-how regarding integration of the BalticGrid applications within the comfortable Grid working environment. All project partners are involved in the exploitation of the product. MD will be widely used by the user community of the project as well as other users from the Baltic and willing to utilize the Grid resources through MD. PSNC products are freely available.
3. **The Virtual User System (VUS)** is a user management system developed by PSNC. VUS was integrated with gLite middleware in the BalticGrid project. The result has the potential to be included in the gLite distribution. VUS may be used in any other gLite based Grid. VUS was initially developed by PSNC as a Globus Toolkit extension and deployed in a number of projects. gLite originates from the EGEE project. Both are Open Source distributions and as such freely available to be used in accordance with the different licenses attached.
4. **Integrating Grid Monitoring Tools.** In order to monitor concluded SLAs in the BalticGrid project, IMCS UL would integrate several monitoring systems including rping and IPPM. The resulting system will perform accurate and targeted monitoring to ensure compliance with SLAs and Grid user requirements. The components of the integrated monitoring system are Open Source distributions and as such freely available to be used in accordance with the different licenses attached.



5. **Service Level Agreement** has been developed and elaborated in the BalticGrid project to meet the requirements of the users and possibilities of the NRENs. The SLA template with appropriate descriptions and explanations can be made available to other parties interested in concluding SLAs.
6. **EGEE compatible Tier-3 computing center.** The Tier-3 center serves as a low level computing facility for high energy physics. The aim of the facility is to provide the Grid local access point and computing resources suitable for application development. As part of SA1 a prototype of Tier-3 was constructed and integrated with the WLCG, the world wide production system used by the LHC collaborations. Its full functionality enables users from a local scientific community to access the Grid, to learn the basics of this technology and improve skills. The initial prototype was extended to a full scale Tier-3 center. It provides a stable support for all necessary Grid services. The middleware components are regularly updated. The Tier-3 center is used by the experiments contributing to BalticGrid project, Atlas and LHCb, as well as by other HEP experiments. It will be gradually extended to meet the requirements of growing data samples collected by running experiments.
7. **Distributed Physics Analysis.** The experience gained from NA3 is essential for experimental groups, in their large scale distributed data analysis and to support users in their applications installation and execution. The two main logical parts of experimental computing systems: (i) the software used to model the experiment and analyze the data and (ii) the Grid interface enriched in the knowledge of experiment specific applications, have been successfully installed on local Tier-3 and they are regularly updated for two experiments: Atlas and LHCb. Users from both experiments develop their applications and submit series of jobs. The Grid interface provides transparent access to the data, with jobs being sent to the centers where the data files are located. Currently the data analysis is based on Monte Carlo samples distributed over the centers involved. The experimental data will be analyzed after the startup of LHC accelerator planned for late summer 2008.
8. **Grid Infrastructure for Training.** Trainings during which capabilities of grid technologies are presented require access to grid resources and well defined procedures. These procedures describe rules for usage of grid infrastructure. IFJ PAN and involved partners have worked out a technical solution and gained experience on how to set up infrastructure for grid trainings and how to cooperate with tutorial organizers in order to provide them with usable, flexible and robust infrastructure for their courses. EENET and NICPB have been involved in providing resources for training. Our experience was recorded in procedures for arranging and running tutorial events as well as building training Grid infrastructure. These procedures and technical solutions can be used by any entity interested in establishing an own infrastructure and carrying out Grid training. Till now we have supported two successful tutorials for about 50 participants which proved our procedures to be of good quality. However, some weak points were also identified and are being improved currently. Our procedures describe technicalities of organization of tutorials, instructions for tutorial organizers and resource providers. They are published on the project web site under the following URL: [http://www.balticgrid.org/Grid\\_Operations/technicalguides/tutorial/](http://www.balticgrid.org/Grid_Operations/technicalguides/tutorial/).



### 3. DISSEMINATION OF KNOWLEDGE

#### 3.1. ACTIVITIES PERFORMED IN THE PROJECT'S FIRST 12 MONTHS (NOVEMBER 2005 – OCTOBER 2006)

##### 3.1.1. Overview Table

Planned /actual Dates	Type	Type of audience	Countries addressed	Size of Audience	Partner responsible /involved
	<b><u>Press releases (press/radio/TV)</u></b>				
21.11.2005	Projekt UE BalticGrid, IT w Krakowie (online Polish journal)	General public, research	Poland	Undetermined	IFJPAN
November 2005	World year of physics marches through continents, Fizikų žinios, Nr. 29 (2005)	Research	Lithuania	Undetermined	ITPA
November 2005	Interview for the Polish Radio, Polish Radio	General public	Poland	Undetermined	IFJPAN
19.11.2005	Komputery lacza sie (Computers unite), Dziennik Polski (a Polish newspaper)	General public	Poland	Undetermined	IFJPAN
December 2005	BalticGrid pievieno Latvijas zinātniekus Eiropas tīklam (BalticGrid connects Latvian scientists to the European network), magazine "Sakaru pasaule"	General public, research	Latvia	Undetermined	IMCS UL
27.12.2005	Summary of year 2005, Estonian Radio (ER)	General public	Estonia	Undetermined	NICPB
January 2006	Grid technologies are coming to Lithuania, journal "Mokslas ir technika" (Science & Technique)	General public, research	Lithuania	Undetermined	ITPA
9.01.2006	Start of the BalticGrid Project, EGEE Newsletter	Research	Europe	Undetermined	IFJPAN, KTH
9.01.2006	The parallel computing network of Baltic countries, web portals: Elektronika.lt, Takas.lt	General public, research	Lithuania	Undetermined	ITPA



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18.01.2006	Radio presentation about BalticGrid, Lithuanian radio, Vilnius, Lithuania	General public	Lithuania	Undetermined	ITPA
February 2006	Article about grids in Latvia, Magazine "Sakaru pasaule"	Research	Latvia	Undetermined	IMCS UL
March 2006	Grid komputerowy – nowe narzędzie dla nauki i zastosowań" (in Polish), magazine "Forum Akademickie" (in Polish)	Research	Poland	Undetermined	IFJPN
20.03.2006	Grid technologies also in Latvia, National News Agency LETA	General public	Latvia	Undetermined	IMCS UL
26.04.2006	Paskirstytieji ir lygiagretūs skaičiavimai jau Lietuvoje (Distributed and parallel computing already in Lithuania), web portal "Elektronika.lt"	Research	Lithuania	Undetermined	VU
April 2006	Distributed and parallel calculations already in Lithuania, Physicist's News (Supplement of Lithuanian Journal of Physics)	Research	Lithuania	Undetermined	VU
April 2006	Latvijas Grid tīkls ir izveidots (Latvian Grid network established), magazine "Sakaru pasaule"	Research	Latvia	Undetermined	IMCS UL
May 2006	Ką pasėsi..., Quarterly magazine of Lithuanian Academy of Sciences	Research	Lithuania	Undetermined	ITPA
May 2006	Distributed and parallel calculations already in Lithuania, magazine "Kompiuterija"	Research	Lithuania	Undetermined	VU
May 2006	LitGrid – network of parallel and distributed computing, newspaper "Universitas Vilnensis"	Research, Higher education	Lithuania	Undetermined	VU
8.06.2006	Grid – the future of effective work, web portals: Elektronika.lt, Vtv.lt, Takas.lt	General public, research	Lithuania	Undetermined	ITPA



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July 2006	LitGrid – network of parallel and distributed computing, journal “Spectrum”	Research	Lithuania	Undetermined	VU
6.07.2006	Grid – the future of effective work, newspaper “Mokslo Lietuva” (Scientific Lithuania)	Research	Lithuania	Undetermined	ITPA
September 2006	Grid – the future of effective work, magazine “Science & Life”	General public, research	Lithuania	Undetermined	ITPA
20.09.2006	Latvijas zinātnieki apgūst pasaules tehnoloģijas (Latvian scientists acquire world technologies), web portal “Delfi” (www.delfi.lv)	General public, research	Latvia	Undetermined	IMCS UL
30.09.2006	Tikls uzvar superdatoru (Network wins supercomputer), magazine “Mēs” (“We”) – addition to the newspaper “Neatkarīgā rīta avīze” (“Independent Morning newspaper”)	General public	Latvia	Undetermined	IMCS UL
3.10.2006	Grid Open Day in Riga mentioned in the Radio SWH (Latvia)	General public	Latvia	Undetermined	IMCS UL
26.10.2006	RTU on Baltic Grid Project, newspaper “Inženieris”	Research, general public	Latvia	Undetermined	RTU
	<b><u>Conferences</u></b>				
24-25.11.2005	BalticGrid Kick-off Meeting	Research, project members	Poland	49	IFJPN
26-28.04.2006	1 <sup>st</sup> BalticGrid All-Hands Meeting and Grid Open Day	Research, higher education, project members	Lithuania	96	VU, ITPA
4-6.10.2006	2 <sup>nd</sup> BalticGrid All-Hands Meeting and Grid Open Day	Research, higher education, project members	Latvia	60	IMCS UL, RTU



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<b><u>Workshops</u></b>					
21-23.11.2005	Cracow Grid Workshop 2005 (CGW'05)	Research, higher education, industry	Poland, Europe	120	IFJPAN
8-10.08.2006	Workshop for Lithuanian cluster administrators and users	Research	Lithuania	20	VU
8-11.10.2006	International ICFA Workshop on HEP Networking, Grid and Digital Divide Issues for Global e-Science	Research	Poland, Europe, Asia, USA	60	IFJPAN
15-18.10.2006	Cracow Grid Workshop 2006 (CGW'06)	Research, higher education, industry	Poland, Europe	170	IFJPAN
<b><u>Exhibitions</u></b>					
27.04.2006	Presentation of the BalticGrid SLA model as a method for market-based resource allocation in computing grids (during the SICS Open House Day)	Industry (IT sector)	Sweden	300	KTH, SICS
19-20.05.2006	BG stand during the Festival of Science, Krakow, Poland	General public, research	Poland	100	IFJPAN
5.06.2006	BG's stand during the conference "Summary of the 6FP in the Polish Malopolskie voivodeship in the light of the Regional Innovative Strategy and preparations to the 7FP", Krakow, Poland	Research, industry	Poland	20	IFJPAN
25-29.09.2006	Migrating Desktop Platform as graphical interactive framework for running Grid applications, the stand during the EGEE'06 conference in Geneva, Switzerland	Research, industry	Switzerland, Europe	A few dozen	PSNC
9-11.10.2006	BG's stand during the International ICFA Workshop on HEP Networking, Grid and	Research	Poland, Europe	20	IFJPAN



	Digital Divide Issues for Global e-Science, Krakow, Poland				
	<b><u>Publications</u></b>				
25.01.2006	Grid Computing Infrastructure, Problems and Perspectives in Lithuania (Proceedings of conference „Informacinės technologijos 2006“. Vol.1. Kaunas University of Technology, Technologija, Kaunas, 2006. pp. 298-302. ISBN 9955-09-993-3)	Research	Lithuania	Undetermined	VU
	<b><u>Project web-site</u></b>				
1.11.2005	BalticGrid web site (www.balticgrid.org)	Research, higher education, project members, general public	Baltic States, Europe	Number of total visitors: 14 787 and unique IPs: 5461 (data for period January-October 2006)	IFJPAN, KTH
	<b><u>Posters</u></b>				
1.03.2006	Application Identification and Support in BalticGrid (during EGEE User Forum)	Research, industry	Switzerland, Europe	50	VU
26.04.2006	BalticGrid poster (during the 1 <sup>st</sup> BG AHM)	Research, higher education, project members	Lithuania	96	IFJPAN, KTH
29.08.2006	Geometrical structure of Co nanoparticles (during International Conference “Advanced Optical Materials and Devices” held in Vilnius)	Research	Lithuania	50	ITPA
25-29.09.2006	Special Interest Groups - a Grid Service (during EGEE’06)	Research, industry	Switzerland, Europe	50	VU
9-11.10.2006	BalticGrid poster – 2 <sup>nd</sup> issue (during the International ICFA)	Research	Poland, Europe, Asia, USA	60	IFJPAN



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	Workshop on HEP Networking, Grid and Digital Divide Issues for Global e-Science)				
	<b><u>Flyers</u></b>				
21.12.2005	Project Presentation (deliverable)	European Commission, Research	Europe	Undetermined	IFJPAN, KTH
22.02.2006	Grid Open Day in Vilnius leaflet	Research, higher education	Baltic States	Undetermined	IFJPAN
31.03.2006	BG general brochure (printed and in electronic version) displayed at 1 <sup>st</sup> , 2 <sup>nd</sup> AHM, BG Summer School, ICFA Workshop	Research, higher education	Lithuania, Estonia, Latvia, Poland	About 300 (hardcopy)	IFJPAN, KTH
April 2006	Project Fact Sheet (printed and in electronic version) displayed at EGEE'06	European Commission, Research	Belgium, Switzerland, Europe	About 100 (hardcopy)	IFJPAN, KTH
19.05.2006	1st BG Summer School leaflet	Research, higher education	Baltic States	Undetermined	IFJPAN
September 2006	Migrating Desktop Platform (printed and in electronic version) displayed at 2 <sup>nd</sup> AHM in Riga	Research, higher education, project members	Latvia, Baltic States	60	PSNC
September 2006	Service Level Agreement Markets and Dynamic Account Management (printed and in electronic version) displayed at 2 <sup>nd</sup> AHM in Riga	Research, higher education, project members	Latvia, Baltic States	60	PSNC
September 2006	StatHEP application – Statistical Data Analysis for High Energy Physics (printed and in electronic version) displayed at 2 <sup>nd</sup> AHM in Riga	Research, higher education, project members	Latvia, Baltic States	60	IFJPAN
	<b><u>Direct e-mailing</u></b>				
24.02.2006	A letter to inform potential Latvian Grid users about the IMCS UL Grid related activities	Research, higher education	Latvia	93 people / organizations	IMCS UL



February 2006	Contacts with the directors of Belarusian and Ukrainian Computer Science institutes concerning a possible cooperation	Research, higher education	Belarus, Ukraine	4	IFJPAN
March 2006	The Open Grid Day introductory letter	Research, higher education, media	Baltic States	Undetermined	IFJPAN, KTH, VU, ITPA
April 2006	Introductory letter to the Customer Feedback Form	Research, higher education	Baltic States	Undetermined	IFJPAN
13.04.2006	An invitation letter to inform potential Latvian Grid users about the first LV Grid Info day, organised by IMCS UL	Research, higher education	Latvia	Undetermined	IMCS UL
19.04.2006	Grid News list created	Research, higher education	Latvia	Undetermined	IMCS UL

### 3.1.2. Short Descriptions of Major Activities

#### Workshops

##### *The Fifth Cracow Grid Workshop (CGW'05), Cracow, Poland, 21 - 23 November 2005*

The Fifth Cracow Grid Workshop (CGW'05) was organized jointly by the Academic Computer Centre CYFRONET, IFJPAN and the Institute of Computer Science AGH. CGW'05 in short:

Some 120 participants representing many EU countries took part in the Workshop, which comprised 5 keynote and 7 invited lectures and two Grid tutorials. Among invited speakers was Per Öster - the BG Project Director - who presented an overview of the Project. Several participants came from the BG partners from Latvia.

Around 67 contributed papers, accepted for presentation during the Workshop, provided a very good overview of the research activity in the area of Grid computing. Therefore NA2 leader took this opportunity and had advertised this event broadly among participants of BG project - launched only three weeks earlier - encouraging them to attend this event as well as the accompanying tutorial.

##### *The Sixth Cracow Grid Workshop (CGW'06), Cracow, Poland, 15 - 18 October 2006*

The Sixth Cracow Grid Workshop (CGW'06) was organized jointly by the Academic Computer Centre CYFRONET, IFJPAN and the Institute of Computer Science AGH.

About 170 participants representing many EU countries took part in the Workshop. During the event several keynote lectures were given, among others by Wolfgang Boch, Head of F2, Information Society and Media DG, EU Fabrizio Gagliardi, Microsoft EMEA, Wolfgang Gentsch, Coordinator of



D-Grid, Carl Kesselman, University of Southern California, and Dieter Kranzlmüller, Johannes Kepler University Linz. More than 100 contributed papers, accepted for presentation during the Workshop, provided a very good overview of the research activity in the area of Grid computing. This international meeting covered: current advances in research in Grid systems and Grid applications, overview of research in the main European Grid projects, overview of national Grid projects and tutorial on "Grid Security - Principles and Practices".

## **Conferences**

### ***BalticGrid Kick-off Meeting, Krakow, Poland, 24 - 25 November 2005***

The First BalticGrid conference and kick-off brought together participants from all Project partners for the first time. The main organizer of the conference was one of the BG partners and leader of the NA2 activity: the Institute of Nuclear Physics PAN (IFJPAN). The event took place on the premises of the Institute in Krakow, Poland. The conference was attended by 49 participants representing 10 institutions from Estonia, Lithuania, Latvia, Poland, Switzerland and Sweden. During the plenary sessions all activity leaders presented their plans for the upcoming months. The members of all activities met and discussed their problems during the parallel sessions.

### ***1<sup>st</sup> BalticGrid All-Hands Meeting, Vilnius, Lithuania, 26 - 27 April 2006***

The First BalticGrid All-Hands meeting brought to Vilnius 96 participants and registered guests. Representatives of all ten Project partners from Estonia, Latvia, Lithuania, Poland, Switzerland and Sweden attended the meeting. The Project Director and Activity Leaders presented the status reports of the Project and discussed problems and their solutions. Four members of the External Advisory Committee (F. Gagliardi, E. Jessen, K. Koski and M. A. Walker) came to observe all the activities and to present their comments and advice to the Executive Board of the Project.

### ***BalticGrid Grid Open Day, Vilnius, Lithuania, 28 April 2006***

In the afternoon of 28 April more than 50 potential further users of the parallel computing joined the meeting on the BalticGrid Project Open Day. This event was opened by the President of Lithuanian Academy of Sciences Zenonas R. Rudzikas and chaired by Grazina Tautvaisiene. Five invited lecturers made presentations on various aspects of Grid-technologies. Fabrizio Gagliardi, an initiator of a number of the European Grid projects, described the use of Grids in science and industry. Maite B. Lopez gave a comprehensive description of the EGEE. The progress of Grid technologies development in Lithuania was presented by Algimantas Juozapavicius, LitGrid Project Director. The Open Day was concluded by a talk of Per Öster on the perspectives of the BalticGrid project.

### ***Grid Open Day, Riga, Latvia, 4 October 2006***

The Grid Open Day was organised to promote the Grid ideas, to give insight into funding issues of Grid, to discuss the possible Grid usages and benefits. Six presentations were given by the BalticGrid project partners and invited speakers. The opening address was given by the rector of the University of Latvia, Dr. Ivars Lacis. There were more than 70 participants from the BalticGrid partners, local scientific institutions and official institutions.



***2<sup>nd</sup> All-Hands Meeting, Riga, Latvia, 5 - 6 October 2006***

The 2nd All-Hands Meeting was held in Riga, co-organised by IMCS UL and RTU. More than 60 participants representing all project partners participated in the plenary sessions and working group meetings. On the first day the status reports were given about all the BalticGrid project activities. There were also more targeted presentations about monitoring Grid, problems with MPI over Infiniband, Prolog and MPI integration as well as about various ways to attract new users. On the second day of the meeting next steps of the Project and ongoing activities were discussed in the working group meetings. Each activities meeting resulted in action items and further steps to continue work on the Project. Cross-activity meetings helped participants to share various issues and to improve the collaboration.

Meetings of the PMB and Executive Board of the Project were held during the event as well.

**Exhibitions**

***The Festival of Science, Krakow, Poland, 19 – 20 May 2006***

The event is held yearly in Krakow. This year at the stand of IFJPAN, the BG materials have been presented (poster and brochures).

***Conference “Summary of the 6FP in the Polish Malopolskie voivodeship in the light of the Regional Innovative Strategy and preparations to the 7FP”, Krakow, Poland, 5 June 2006***

At the stand of IFJPAN, the BG materials have been presented (poster and brochures).

***EGEE II conference, Geneva, Switzerland, 25-29 September 2006***

At the stand of the BG project, materials concerning Migrating Desktop role/tasks in BalticGrid project and main goals of BalticGrid have been presented as well as a poster concerning Special Interest Groups in BG was shown (in slides format).

***International ICFA Workshop on HEP Networking, Grid and Digital Divide Issues for Global e-Science, Krakow, Poland, 9-11 October 2006***

At the stand of IFJPAN, the BG materials have been presented (poster, brochures and pens).



### 3.2. ACTIVITIES PERFORMED IN THE PROJECT'S LAST 18 MONTHS (NOVEMBER 2006 – APRIL 2008)

#### 3.2.1. Overview Table

Planned /actual Dates	Type	Type of audience	Countries addressed	Size of Audience	Partner responsible /involved
	<b><u>Press releases (press/radio/TV)</u></b>				
December 2006	The BalticGrid project celebrates first birthday, Elektronika.lt (the internet magazine for Electronics: Elektronika.lt), Vtv.lt (the Virtual Society Portal), Nkm.lt (the journal New Communication portal), Technologijos.lt (The Science and technology portal)	General public, research	Lithuania	Undetermined	ITPA
December 2006	Latvijas Grid tīkls E-Zinātnes attīstībai (Latvian Grid network for the development of E-Science), magazine "Sakaru pasaule"	General public, research	Latvia	Undetermined	IMCS UL
5.12.2006	Vai dators gatavosies eksāmeniem arī Latvijas skolēna vietā? (Will the computer do exams instead of Latvian pupil?), newspaper "Vakara Ziņas" ("Evening News")	General public	Latvia	Undetermined	IMCS UL
January 2007	Tīkls uzvar datoru, (Network wins computer), magazine "Next"	General public	Latvia	Undetermined	IMCS UL
7.01.2007	The first BalticGrid birthday, newspaper "The Scientific Lithuania"	Research	Lithuania	Undetermined	ITPA
9.01.2007	About Litgrid project, newspaper "Inžinerija"	General public, research	Lithuania	Undetermined	VU
7.02.2007	Grid laczy (Grid unites),	General	Poland	Undetermined	IFJPAN



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	newspaper “Dziennik Polski”	public			
March 2007	Latvijas akadēmiskais datortīkls – Eiropas sastāvdaļa (Latvian academic network – European component), magazine “Sakaru pasaule” (Connection world)	General public, research	Latvia	Undetermined	IMCS UL
March 2007	The LAS book: “The Activity of the Lithuanian Academy of Sciences in 2006”	General public, research	Lithuania	Undetermined	ITPA
12.03.2007	LitGrid presentation, journal “Mokslas ir technika”	Research	Lithuania	Undetermined	VU
23.04.2007	Press release “Zinātnieku atbalstam prezentēs GEANT un "Grid" iespējas” (GEANT and Grid possibilities presented to support scientists), web portals: pcentrs.lv, reitingi.lv, fails.lv, boot.lv, tehnika.delfi.lv, tvnet.lv	General public, research	Latvia	Undetermined	IMCS UL
June 2007	Grid continues to develop (Grid tīkls turpina attīstīties), magazine “Sakaru pasaule” (Connection world)	General public, research	Latvia	Undetermined	IMCS UL
29.06.2007	Press release “Zinātniekus gatavos darbam ar “Grid”” (Scientists will learn how to use Grid), web portals: apollo.lv, db.lv, reitingi.lv, rtu.lv, radio SWH	General public, research	Latvia	Undetermined	IMCS UL
5.07.2007	Maailma suurim teadusaparaat (The biggest scientific instrument of the world), popular science magazine “Horisont”	Research	Estonia	Undetermined	NICPB
October 2007	Science and Organized Civil Society, science popularization journal	Research	Lithuania	Undetermined	ITPA



	“Mokslas ir gyvenimas” (Science and Life)				
November 2007	It is important for Baltic States to coordinate their voices and activities, (translation from Lithuanian), newspaper “Moklso Lietuva” (“Scientific Lithuania”)	Research	Lithuania	Undetermined	ITPA
November 2007	Science and organized civil society (translation from Lithuanian), journal “Mokslas ir gyvenimas” (“Science and life”)	Research	Lithuania	Undetermined	ITPA
January 2008	LitGrid: parallel construction of successful e-Infrastructures, EGI eNewsletter 1/2008	Research, higher education	Europe	Undetermined	VU
March 2008	BalticGrid set to expand EU e-Infrastructure, eStrategies Projects - Celebrating Research and Development in Europe, issue 3, British Publishers	Research, higher education	UK, Europe	Undetermined	KTH
3.04.2008	Siekiamą tobulinti nacionalinį superkompiuterį (Aiming to upgrade national supercomputer), newspaper “Verslo žinios” (“Business news”)	General public	Lithuania	Undetermined	VU
	<b><u>Conferences</u></b>				
14.02.2007	65 <sup>th</sup> conference of the University of Latvia, Section of the Grid technologies	Research	Latvia	20	IMCS UL
15- 17.05.2007	3 <sup>rd</sup> BalticGrid All-Hands Meeting and Grid Open Day	Research, higher education, industry, project members	Estonia	54	NICPB
12- 14.12.2007	4th BG All-Hands Meeting	Research, higher education, industry,	Sweden	61	KTH



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		project members			
13.02.2008	66 <sup>th</sup> conference of the University of Latvia, Section of the Grid technologies	Research	Latvia	35	IMCS UL
	<b><u>Workshops</u></b>				
2.11.2006	Grid users' workshop	Research, higher education	Lithuania	30	VU
27.11.2006	All hands meeting of the Institute of Theoretical Physics and Astronomy of Vilnius University	Research, project participants	Lithuania	20	VU
15.12.2006	Annual reporting meeting of grid activities in Lithuania (workshop)	Research, higher education	Lithuania	30	VU
18.01.2007	Application workshop with IFJPAN representative	Research, higher education	Latvia	18	IMCS UL, IFJPAN
24.04.2007	GEANT and Grid Info day	Research, higher education	Latvia	50	IMCS UL
27.04.2007	Internal workshop at RTU	Project participants	Latvia	9	RTU
7-11.05.2007	BOF: "Remote Instrumentation in Grid Environment"	Research, higher education, industry	UK, Europe	30	PSNC, NICPB
18.06.2007	BalticGrid SIG workshop	Research, higher education	Lithuania	50	VU
15.10.2007	Cracow Grid Workshop 2007 (CGW'07)	Research, higher education, industry	Poland, Europe	150	IFJPAN
12.03.2008	Internal workshop held to prepare RTU ETF seminar "Large capacity computing with Grid."	Project participants	Latvia	7	RTU
25.04.2008	LitGrid workshop	Research, higher education	Lithuania	25	VU



<b><u>Exhibitions</u></b>					
8-15.05.2007	BalticGrid project stand during the EGEE UF / OGF 20, Manchester, UK	Research, industry	UK, Europe	600	IFJPAN, PSNC
1-3.10.2007	BalticGrid project stand during the EGEE'07 conference, Budapest, Hungary	Research, industry	Hungary, Europe	500	IFJPAN, PSNC
11-14.02.2008	BalticGrid project stand during the 3 <sup>rd</sup> EGEE UF, Clermont-Ferrand, France	Research, industry	France, Europe	300	IFJPAN, PSNC
<b><u>Publications</u></b>					
June 2006	Studying doubly charged Higgs pair production at the LHC (Proceedings of the Estonian Academy of Sciences Physics Mathematics, 2006, Vol. 55, No. 2, 128-136.)	Research	Estonia	Undetermined	NICPB
June 2006	CMS Physics TDR 8.1 Volume I: Detector Performance and Software (CERN Publication)	Research	Estonia, Switzerland	Undetermined	NICPB, CERN
September 2006	CMS Physics TDR 8.2 Volume II: Physics Performance (CERN Publication)	Research	Estonia, Switzerland	Undetermined	NICPB, CERN
September 2006	Les Houches physics at TeV colliders 2005 beyond the standard model working group: Summary report (Proceeding, Les Houches)	Research	Estonia, Switzerland	Undetermined	NICPB (Les Houches Beyond Standard Model Workgroup)
30.11.2006	Monitoring of L <sub>2,3</sub> X-ray emission of transition element atoms near 2p threshold (Lithuanian Journal of Physics, 2006, Vol. 46, No. 4, 425-431)	Research	Lithuania	Undetermined	ITPA
25.01.2007	Geometrical structure of small Co nanoparticles (Proceedings of the International Society for Optical Engineering)	Research	Lithuania	Undetermined	ITPA



26.01.2007	Global Characteristics of Atomic Spectra and Their Use for the Analysis of Spectra. VI. Transition Arrays in the Relativistic Dirac-Breit Approximation (Physica Scripta, 2007, Vol. 75, 237-244)	Research	Lithuania	Undetermined	ITPA
22.02.2007	A general expression for the excitation cross-section of polarized atoms by polarized electrons (Physica Scripta, 2007, vol. 75, p. 524-530)	Research	Lithuania	Undetermined	ITPA
24.05.2007	On the interpretation of the intense emission of tungsten ions at about 5 nm (Journal of Physics B: Atomic, Molecular and Optical physics, vol. 40, (2007), 2179-2188)	Research	Lithuania, UK	Undetermined	ITPA
June 2007	Theoretical investigation of energy spectra of tungsten $W^{29+}$ - $W^{34+}$ (Lithuanian Journal of Physics)	Research	Lithuania	Undetermined	ITPA
August 2007	Metamodels for the optimization of damage-tolerant composite structures (Proceedings of ICAS 2008 – 26th Congress of International Council of the Aeronautical Sciences)	Research	Latvia, USA	Undetermined	IMCS UL
August 2007	Testing neutrino masses in little Higgs models via discovery of doubly charged Higgs at LHC (Nuclear Physics B, 787 (2007) 198-210)	Research	Estonia	Undetermined	NICPB
October 2007	Harvesting National Language Text Corpora from the Web (Proceedings of the Third Baltic conference “Human Language Technologies”, 4-5 October 2007, Kaunas,	Research	Latvia, Lithuania	Undetermined	IMCS UL



	Lithuania)				
24.10.2007	Dynamic User Management in the BalticGrid Project (Proceedings of the eChallenges e-2007 Conference & Exhibition, Hague, 24-26.10.2007)	Research	Poland, The Netherlands, Europe	Undetermined	PSNC
24-27.10.2007	Networking and Grid in Poland and Eastern European Countries (Proceedings of the International ICFA Workshop on Digital Divide Issues for Global e-Science, Mexico City, 24-27 October 2007)	Research	Poland, Mexico	Undetermined	IFJPAN
November 2007	Intensity enhancement in the emission spectra of Sb, Sn, and W ions due to the mixing of configurations with symmetric exchange of symmetry (Lithuanian Journal of Physics, 2007 No.3)	Research	Lithuania	Undetermined	ITPA
1.11.2007	Theoretical Study of Benzofused Thieno[3,2-b]furans in the reactions with electrophiles (11th International Electronic Conference on Synthetic Organic Chemistry)	Research	Lithuania, Switzerland	Undetermined	ITPA
December 2007	First Stellar Abundances in the Dwarf Irregular Galaxy IC1613 (Astronomical Journal, vol. 134, p.2318-2327 (2007))	Research	Lithuania, USA	Undetermined	ITPA
December 2007	Numerical Simulations of the Ionic Transfer in Shocked Electrolytes (Latvian Journal of Physics and Technical Sciences)	Research	Latvia	Undetermined	IMCS UL
20.01.2008	Direct and inverse meta modeling of composite stiffened structures with	Research	Latvia, Canada	Undetermined	IMCS UL



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	predetermined degradation (Proceedings of the 12th AIAA/ISSMO Multidisciplinary Analysis and Optimization Conference)				
18.04.2008	<i>Ab initio</i> oscillator strengths and transition probabilities in oxygen-like Cr XVII (Atomic Data and Nuclear Data Tables)	Research	Lithuania, Canada	Undetermined	VU
	<b><u>Project web-site</u></b>				
1.11.2006	BalticGrid web site (www.balticgrid.org)	Research, higher education, project members, general public	Baltic States, Europe, USA, China	Number of total visitors: 106614 and unique IPs: 56958 (data for period November 2006 - April 2008)	IFJPAN, KTH
	<b><u>Posters</u></b>				
6.02.2007	RTU ETF Grid Cluster (during the Information Day in Brussels)	Research, industry	Latvia, Belgium	50	RTU
7-11.05.2007	Expanding the Reach of EGEE (during EGEE UF in Manchester)	Research, industry	UK, Europe	600	IFJPAN, CERN
8-10.05.2007	Migrating Desktop Platform framework for grid Applications - roll stand (during EGEE UF in Manchester)	Research, industry	UK, Europe	600	PSNC
8-10.05.2007	Technical components poster: JRA: Service Level Agreement - Markets and Dynamic Account Management (during EGEE UF in Manchester)	Research, industry	UK, Europe	600	PSNC
9-11.05.2007	Poster about Prolog-MPI developments (during EGEE UF in Manchester)	Research, industry	UK, Europe	600	IMCS UL
15-17.05.2007	Migrating Desktop Platform framework for grid Applications - roll stand (during the Grid	Research, higher education, industry,	Estonia	54	PSNC



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	Open Day in Tallinn)	Project members			
21-24.05.2007	Poster on BalticGrid (during TERENA Networking Conference 2007)	Research	Denmark, Europe	Undetermined	IMCS UL
12.06.2007	Poster: Quantum chemical investigation of Co <sub>2</sub> O <sub>n</sub> (n=1-7) (during 37-th Lithuania National Physics Conference, held in Vilnius)	Research	Lithuania	Undetermined	ITPA
15-17.10.2007	Recent Extensions in Application Monitoring System OCM-G (during CGW'07)	Research, higher education, industry	Poland, Europe	150	IFJPAN
15-17.10.2007	A Performance Visualization Tool – Candle (during CGW'07)	Research, higher education, industry	Poland, Europe	150	IFJPAN
15-17.10.2007	A View on Site Efficiency with Batch System Analysis Tool (during CGW'07)	Research, higher education, industry	Poland, Europe	150	IFJPAN
11-14.02.2008	BalticGrid Project – Applications (during the 3 <sup>rd</sup> EGEE UF, Clermont-Ferrand, France)	Research, industry	France, Europe	300	IFJPAN, VU, ITPA, IMCS UL
5.03.2008	RTU ETF cluster – from dummies to experts (during internal RTU presentations)	Research	Latvia	Undetermined	RTU
	<b><u>Flyers</u></b>				
8.11.2006	Lithuanian GRID – LitGrid (distributed during the seminar presenting LitGrid and BalticGrid projects)	Research	Lithuania		VU
8-10.05.2007	OCM-G – Grid enabled OMIS Compliant Monitoring (distributed during EGEE UF / OGF20 in Manchester)	Research, industry	UK, Europe	600	IFJPAN
15-17.05.2007	General BG Brochure update – issue 2	Research, higher	Estonia	54	IFJPAN



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	(distributed during the 3rd BalticGrid AHM and Grid Open Day in Tallinn)	education, industry			
31.08.2007	The SyntSpec Technical Brochure for BalticGrid (available at the Project web site)	Research, higher education, general public	Europe	Undetermined	ITPA
1-3.10.2007	Deformation calculations of composite structures by ANSYS & Grid (distributed during the EGEE'07 conference in Budapest)	Research, higher education, industry	Hungary, Europe	500	IMCS UL
23.10.2007	Technical brochure: Vilnius Parallel Shell Model Code (VPSM) for large-scale nuclear structure calculations (available at the Project web site)	Research, higher education, general public	Europe	Undetermined	ITPA
24.10.2007	Technical brochure: Calculation of atomic characteristics with FAC and VMAS codes (available at the Project web site)	Research, higher education, general public	Europe	Undetermined	ITPA
31.10.2007	Technical brochure: Grid Operations (available at the Project web site)	Research, higher education, general public	Europe	Undetermined	IFJPAN, NICPB, EENet
November 2007	Technical brochure: Investigation of Atoms and Ions (available at the Project web site)	Research, higher education, general public	Europe	Undetermined	ITPA
November 2007	Technical brochure: GAMESS applications (available at the Project web site)	Research, higher education, general public	Europe	Undetermined	ITPA
11-14.02.2008	Biosensors (distributed during the 3 <sup>rd</sup> EGEE User Forum in Clermont-Ferrand)	Research, higher education, industry	France, Europe	300	VU



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11-14.02.2008	Multidimensional Scalling - Numerical Solution of Parabolic Models with Nonlocal Conditions (distributed during the 3 <sup>rd</sup> EGEE User Forum in Clermont-Ferrand)	Research, higher education, industry	France, Europe	300	VU
11-14.02.2008	Baltic Sea Eco-System Modeling - Ecollogical Modeling of hydroecosystems (distributed during the 3 <sup>rd</sup> EGEE User Forum in Clermont-Ferrand)	Research, higher education, industry	France, Europe	300	VU
11-14.02.2008	Computer Modeling Numerical Solution of Parabolic Models with Nonlocal Conditions (distributed during the 3 <sup>rd</sup> EGEE User Forum in Clermont-Ferrand)	Research, higher education, industry	France, Europe	300	VU
11-14.02.2008	Computer Modeling of Electric Conduction in Cell Membrane (distributed during the 3 <sup>rd</sup> EGEE User Forum in Clermont-Ferrand)	Research, higher education, industry	France, Europe	300	VU
11-14.02.2008	Generalized Grid Data Mining Toolkit: Advanced Moving Object Generator (distributed during the 3 <sup>rd</sup> EGEE User Forum in Clermont-Ferrand)	Research, higher education, industry	France, Europe	300	VU
	<b><u>Direct e-mailing</u></b>				
20.02.2007	Information about IMCS UL and the BalticGrid project sent to the Minister of Science and Education	Minister of Science and Education in Latvia	Latvia	1	IMCS UL
March 2007	Information about IMCS UL and the projects it is involved, prepared for the members of parliament	Minister of Science and Education, the members of the Latvian parliament	Latvia	Undetermined	IMCS UL



### 3.2.2. Short Descriptions of Major Activities

#### Workshops

##### ***Grid users' workshop, Vilnius, Lithuania, 2 November 2006***

The workshop was organized by Vilnius University for grid users in order to make usage of grid resources in more intensive way, to encourage users to gridify their applications. During the workshop the main problems of the users were identified and possible solutions were found.

##### ***All hands meeting of the Institute of Theoretical Physics and Astronomy of Vilnius University, Vilnius, Lithuania, 27 November 2006***

The all hands meeting of project participants from VU ITPA brought together all scientists, developers and activity leaders. There were a number of questions discussed:

- the results and ideas, from all hands meeting in Riga and the PMB meeting in Geneva,
- actualities concerning new applications in Grid environment,
- possible technical solutions of existing problems,
- achievements (increasing number of users and applications),
- possible ways for more efficient usage of Grid and CPU time,
- the future plans and aims.

##### ***Annual reporting meeting of grid activities in Lithuania, Vilnius, Lithuania, 15 December 2006***

The workshop was organized as an annual reporting meeting of grid activities in Lithuania. The representatives from 11 universities and research institutes participated in this workshop. All of them reported about their grid activities during 2006.

##### ***Application workshop with IFJPAN representative, Riga, Latvia, 18 January 2007***

Tomasz Szepieniec (IFJPAN) has visited IMCS UL and together with the IMCS UL employees a very productive workshop was held. The possibilities to use OCM-G were discussed, as well as the best way to adapt out applications (ANSYS, Prolog MPI, etc.) to the Grid environment.

##### ***GEANT and Grid Info day, Riga, Latvia, 24 April 2007***

The annual Latvian Grid Info day was organised in conjunction with the GEANT event. The achievements of the BalticGrid project were presented including the overall project update and presentations about Grid usage in Latvia. The Migrating Desktop adaptation for the SentiKamols application was demonstrated. RTU developments were presented, as well as some innovative presentations about the Data Grid were given.

##### ***Internal workshop in RTU, Riga, Latvia, 27 April 2007***

The report about last six months' significant items and works was given:

- WMS server was installed and tested and is ready to use,
- RTU according to time schedule was monitoring BG ticketing watching,
- Slaidins and Belmanis successfully participated in Spanish conference on science grid computing with BG project and RTU presentation,
- it was decided to participate in OGF in Manchester.



***BOF: "Remote Instrumentation in Grid Environment", Manchester, UK, 7 – 11 May 2007***

The BOF meeting (RISGE - Remote Instrumentation in Grid Environment) at OGF20 was co-organised by PSNC. The goal was to start a new research group with engagement of BalticGrid community.

***BalticGrid SIG workshop, Vilnius, Lithuania, 18 June 2006***

The workshop was arranged to introduce the features of SIG for users and application developers. Algimantas Juozapavičius has made introduction to SIG activities and explained the main services provided by SIG to grid users. Tomas Anbinderis made second presentation about gridcom (Grid Commander) and explained in detail how to adopt application in order to use from SIG environment. After presentation a long time discussion started.

***The Seventh Cracow Grid Workshop (CGW'07), Cracow, Poland, 15 - 17 October 2007***

The Seventh Cracow Grid Workshop ([www.cyfronet.pl/cgw07/](http://www.cyfronet.pl/cgw07/)) was organized jointly by the Academic Computer Centre CYFRONET, IFJPAN, the Institute of Computer Science AGH and Jagiellonian University, Collegium Medicum, Krakow.

About 150 participants representing many EU countries took part in the Workshop. During the event several keynote lectures were given. Almost 100 contributed papers, accepted for presentation during the Workshop, provided a very good overview of the research activity in the area of Grid computing. This international meeting covered current advances in research in Grid systems and Grid applications, overviews of research in the main European Grid projects, overviews of national Grid projects and the Chemomentum Tutorial. Among the contributed papers 4 papers have been delivered by the BalticGrid members, which concerned some tools developed within the framework of the BG project as well as results of investigation obtained using RTU cluster connected to BG VO for running small size tasks. During the conference a number of BalticGrid brochures have been distributed among the participants.

***Internal workshop in RTU to prepare RTU ETF seminar "Large capacity computing with Grid", Riga, Latvia, 12 March 2008***

The task of the workshop was to improve and accept presentations prepared by RTU BG team for RTU ETF seminar. Seminar was planned to be held on March 19, 2008.

***LitGrid workshop, Vilnius, Lithuania, 25 April 2008***

Workshop was organized to coordinate workflow in GridTechno and LitGrid projects. It also was discussed about collaboration possibility between NorduGrid, LitGrid and BalticGrid II projects. Future work plans in BalticGrid II project was discussed.

## **Conferences**

***3rd BalticGrid All-Hands Meeting with Grid Open Day and Grid Tutorial, Tallinn, Estonia, 15 -17 May 2007***

The third All Hands Meeting (AHM3) was held at the Estonian Academy of Science and National Institute of Chemical Physics and Biophysics (NICPB), Tallinn, Estonia, from May 15 to May 17 2007. AHM3 was arranged by the High Energy Physics group at the NICPB.



The meeting was divided between three days. The first day had an open public seminar with the general introduction to the Grid, so called Grid Open Day. Potential users of the parallel computing joined this meeting. In the same day a practical tutorial session was held to introduce the Grid and some applications of Grid. The tutorial comprised basics and advances of the Grid. The second day was devoted to the plenary sessions of the BG project. The third day had parallel sessions for all the activities of the project. The meeting ended with a joint conclusion session.

#### ***4th BalticGrid All-Hands Meeting, Stockholm, Sweden, 12 -14 December 2007***

The fourth All Hands Meeting (AHM4) was held at the Royal Institute of Technology (KTH) in Stockholm, Sweden, from December 12 to December 14, 2007.

The meeting was the last one from the series of the All Hands Meetings (AHM) of the BalticGrid (BG) project. The AHM meetings have been organized several times during the Project life to present the status of the project and its all activities for the whole Consortium as well as to make summaries of the project progress and plans for the future.

AHM4 covered 3 days. In the afternoon of the first day the PMB members met to discuss the most important issues concerning the last months of the Project. The second day started with an invited presentation given by dr Henrik Persson from Microsoft (the main sponsor of the event) on High Productivity Computing. Subsequent talks of the plenary session were focused on the BG project itself – the status of the dissemination, Grid applications, Grid operations, networking and research activities has been presented.

A plenary session covered the first half of day and afterwards the joint parallel sessions as well as the internal meetings took place. The third day comprised five parallel sessions, a session per activity of the BG project, and the joint conclusion meeting summarized the third day and the whole AHM4.

### **Exhibitions**

#### ***BalticGrid project stand during the EGEE UF / OGF 20, Manchester, UK, 8-15 May 2007***

Zofia Mosurska, Robert Pajak, Tadeusz Szymocha (IFJPAN) and Bartek Palak (PSNC) were managing the BalticGrid booth during the EGEE UF and OGF 20 with help of EENet's people who were also involved in introducing BalticGrid project on the event. The following materials were presented: Project multimedia presentation, brochures, posters and pens. Many persons visited the BG stand asking about the Project in general as well as looking for answers to some more technical questions. The stand was a great success of the Project and increased its visibility among other Grid projects and initiatives.

#### ***BalticGrid project stand during the EGEE'07 conference, Budapest, Hungary, 1-3 October 2007***

Robert Pajak (IFJPAN), Baiba Kaskina (IMCS UL) and Bartek Palak (PSNC) were managing the BalticGrid booth during the EGEE'07 conference. The following materials were presented: the Project multimedia presentation, the Project general poster, brochures and pens.

Additionally, the live demo titled: “The Stellar Spectra Modelling as an example of data- and compute-intensive application running on the BalticGrid Project testbed” was shown. The Stellar Spectra Modeling package SYNTSPEC was presented – the gridified tool for stellar spectra analysis – as an example of data- and compute-intensive application running on the testbed of the EU BalticGrid Project – interoperable with EGEE resources and complementary with the EGEE infrastructure.



Algimantas Juozapavičius and Margarita Kazakevičiūtė from VU have also participated in EGEE'07 conference. Dr. Margarita Kazakevičiūtė has presented BalticGrid Special Interest Groups (SIGs) at a special demo session. On-line demonstration of SIG has been made. Many visitors have been interested in SIGs. Several visitors from universities proposed to use SIG as tool for educating students to use grid.

The other application of the BG project (ANSYS) was displayed as an off-line demo presenting its integration with the Migration Desktop and visualization of the results.

***BalticGrid project stand during the 3rd EGEE UF, Clermont-Ferrand, France, 11-14 February 2008***

Zofia Mosurska and Robert Pajak (IFJ PAN), Bartek Palak (PSNC) and Jelena Tamuliene (ITPA) were managing the BalticGrid booth during the 3rd EGEE UF.

The following materials were presented: BG movie - presenting the project's two-year work and results, demos showing examples of the BG applications running in the framework of the Migrating Desktop, the set of technical brochures, posters as well as pens. Many persons visited the BG stand asking about the Project in general as well as looking for the answers to some more technical questions, e.g. concerning the BG infrastructure, applications and Migrating Desktop. The presence of the Project at such a big and important event increased well its visibility among other Grid projects and national initiatives.



## 4. PUBLISHABLE RESULTS

### 4.1. INTEGRATION OF TYCOON MARKET-BASED GRID SYSTEM WITH GLITE

**Result description:** A pilot installation of the Tycoon system was deployed and tested on a heterogeneous environment (with and without gLite integration). Installation, configuration, deployment and testing were fully documented, with documentation available to the public. Several considerable flaws and caveats were discovered during the research phase of this activity, specifically within the banking component of the system. These have not yet been satisfactorily addressed by the vendor, H.P. Labs. Furthermore, questions regarding source licenses and availability are also pending. An open dialogue exists between H.P. Labs and the BalticGrid to address unresolved issues.

**Possible market applications:** Licensing of some parts of this tool (GPL) limit commercialization. Tycoon is a product of H.P. Labs.

**Stage of development:** This product is not mature enough for wide-spread production use, with outstanding issues in the existing implementation and uncertainty in future availability.

**Collaboration sought or offered:** Collaboration sought and offered on researching resource management tools on clusters and grids.

**Collaborator details:** Users and developers of resource management tools on clusters and grids.

**Intellectual property rights:** Uncertain, pending clarification by the vendor.

**Contact Details:** kristaps@kth.se

### 4.2. MIGRATING DESKTOP INTEGRATION

**Result description:** The Migrating Desktop Platform is a powerful and flexible user interface to Grid resources that gives a transparent user work environment and easy access to resources and network file systems independently of the system version and hardware. It allows the user to run applications and tools, manage data files, and store personal settings independently of the location or the terminal type. The Migrating Desktop is an advanced graphical user interface similar to a window-based operating system that hides the complexity of the grid middleware and makes access to the grid resources easy and transparent. It offers: flexible personalized working environment available independently of the user location, scalability and portability, a set of tools, a single sign-on mechanism, and support for multiple grid infrastructures.

**Possible market applications:** The large-scale success of and demand for computing technologies depend heavily on ease of access and use experienced by users that are non-experts in the technology and systems being used. It is also crucial, to attract new scientific and industrial user communities, to enable user-friendly and intuitive access to grid environment. We believe that the Migrating Desktop – advanced graphical user interface and a set of tools combined with a user-friendly outlook, similar to window based operating systems - could be useful for grid users, hiding the complexity of the gLite grid middleware, as well as for grid application developers, by speeding up the application integration process.

**Stage of development:** Migrating Desktop was created in The EU CrossGrid Project (<http://www.crossgrid.org>) and is currently developed in The EU Interactive European Grid Project (<http://www.interactive-grid.eu/>), where handling interactive grid applications is being implemented. Migrating Desktop has been deployed within BalticGrid infrastructure. The integration of many applications, come from various projects and science areas, proved correctness of platform integration mechanisms and procedures. Now, Migrating Desktop Platform is fully operational - in everyday work it proved its usefulness as a tool that makes grid application usage much easier and more intuitive



which is essential for the encouraging potential beneficiaries to reap profits from using grid infrastructure for compute- and data-intensive applications.

**Collaboration sought or offered:** Exchange of information.

**Collaborator details:** Users and developers of Grid applications.

**Intellectual property rights:** Open source software license.

**Contact Details:** meyer@man.poznan.pl, bartek@man.poznan.pl, <http://desktop.psnc.pl/>

#### 4.3. VIRTUAL USER SYSTEM FOR GLITE

**Result description:** Virtual User System is software for automated user management integrated with gLite middleware. It is a module responsible for authorization and mapping global grid users to local accounts. It may be deployed on any Computing Element site. The benefits of using Virtual User System comparing to the standard gLite solution is improved automation of the mapping process, storing history of the mappings (which is important from the security point of view) and possibility of storing non-standard accounting metrics in its database.

**Possible market applications:** The Virtual User System, in this version, is a module of gLite responsible for user management and authorization. So that, it may be used anywhere the gLite software is used on grid sites. Potential users of the system are administrators of BalticGrid and other gLite-based grids.

**Stage of development:** Production quality – fully operable. Virtual User System has been working continuously on several sites in the polish grid –Clusterix for a couple of years. This deployment proved it scalability and usability. The gLite – integrated version currently works in a small BalticGrid testbed, including a production site. It is going to be deployed on the whole infrastructure in the BalticGrid-II project.

**Collaboration sought or offered:** Technical support, exchange of information.

**Collaborator details:** Administrators of BalticGrid and other gLite-based grids.

**Intellectual property rights:** Open Source software license.

**Contact Details:** Michał Jankowski jankowsk@man.poznan.pl, <http://vus.psnc.pl>

#### 4.4. GRID MONITORING SYSTEM

**Result description:** The elaborated Grid monitoring system allows to control and register the network status, accessibility of the Grid clusters, the characteristics of the international links and the connection possibilities to the Grid resource centres at the user institutions. The appropriate information is collected from the network devices via SNMP protocol. The data are collected regularly, at least every 5 minutes.

Another tool used to gather data is rping. It is a good way to monitor the connectivity between several remote hosts and helps to localize possible network problems. Rping monitors each network link independently. Along with bandwidth graphs rping can be used to test the quality of the connection and to see how the quality of the connection corresponds with SLA (Service Level Agreement) in long-term. When rping times increase, it is an indicator, that the particular network link has problems, for example duplex mismatch, too high utilization, packet drops, etc.

The measurements gathered by the monitoring system are analysed in order to identify trends in the grid usage and to carry out measures necessary for the improvement of network services. The monitoring system also helps to spot potential problems and take countermeasures in due time. The



monitoring is focused on the network performance data relevant to the type of the specific provisioning set up in the concluded SLA. The graphic presentation tools of the data are developed that operate on the system portal <http://gridimon.balticgrid.org> and visualise the grid connections and their performance.

**Possible market applications:** The possible market for this monitoring system is grid administrators of relatively small networks, especially if the user organisations have concluded SLA, and which needs to be monitored and the adherence to it should be regularly reported and analyzed. The system, especially its graphic presentation tools, can be used in the education process of grid administrators and common grid users as well. The monitoring system does not depend substantially on the specific agreement that should be monitored, so the usage is not limited to the grid networks only.

**Stage of development:** The monitoring system already works for several months and the results of its operations are visually presented at the system portal <http://gridimon.balticgrid.org>. It allows analysing the available grid connections and their load.

**Collaboration sought or offered:** Information exchange from users.

**Collaborator details:** Grid administrators and grid users.

**Intellectual property rights:** Several components are open source and their intellectual property rights are tackled within respective license agreements. The holder of intellectual property rights for the new components is the Institute of Mathematics and Computer Science of the University of Latvia.

**Contact Details:** Technical contact: [martins.libins@sigmanet.lv](mailto:martins.libins@sigmanet.lv), admin contact: [baiba.kaskina@sigmanet.lv](mailto:baiba.kaskina@sigmanet.lv)

#### 4.5. SLA TEMPLATE

**Result description:** For organizations participating in grid activities it is very important to set a proper legal environment for the mutual obligations and tasks of the involved networking organizations. The framework of the Service Level Agreement (SLA) for grid network service providers was elaborated and its implementation for the BalticGrid participants proposed. Both the over-provisioning of network resources and the providing of the services of defined quality according to the proposed classification of the QoS were outlined as the main strategies in the SLA. The possibility to monitor both the network parameters and their compliance to the agreed characteristics was envisaged in the SLA.

**Possible market applications:** The possible users of the elaborated SLA template are managers of grid networks, who can easily modify the template according to their needs. The template can be useful also for those who are attempting to create a sustainable network from organizations of diverse structure and of different working systems, for example, a data storage network or a network of digital libraries or similar networks that may come into being in the future. The template does not depend on the system of grid monitoring, though the BalticGrid monitoring system can be offered for the monitoring of service level agreements.

**Stage of development:** The Service Level Agreements were elaborated for BalticGrid project participants and they were signed by the networks of Latvia, Lithuania and Estonia. The system of grid network monitoring was also implemented..

**Collaboration sought or offered:** Information exchange.

**Collaborator details:** Research and education networks and their officers.

**Intellectual property rights:** The holder of intellectual property rights for the template is the Institute of Mathematics and Computer Science of the University of Latvia.



**Contact Details:** Technical contact: [katrina.sataki@sigmanet.lv](mailto:katrina.sataki@sigmanet.lv), admin contact: [baiba.kaskina@sigmanet.lv](mailto:baiba.kaskina@sigmanet.lv)

#### 4.6. EGEE COMPATIBLE TIER-3 COMPUTING CENTER

**Result description:** Fully functional, EGEE compatible center has been built and integrated in the BalticGrid infrastructure. The hardware is based on blade technology. It consists of 64 cores and 6 TB of disk storage. The functionality includes the WLCG (Worldwide LHC Computing Grid) to allow executing the applications prepared by the LHC experiments. The Tier-3 computing facility is essential to the local HEP community, facilitating their participation in preparations for the startup of large experiments.

**Possible market applications:** The Tier-3 cluster is used for scientific research only.

**Stage of development:** The local Tier-3 center reached the stage of production quality fulfilling all requirements for the EGEE middleware.

**Collaboration sought or offered:** Exchange of information between centers involved in experimental collaborations.

**Collaborator details:** The centers involved in experimental collaborations.

**Intellectual property rights:** none.

**Contact Details:** [Henryk.Palka@ifj.edu.pl](mailto:Henryk.Palka@ifj.edu.pl), [Mariusz.Witek@ifj.edu.pl](mailto:Mariusz.Witek@ifj.edu.pl)

#### 4.7. DISTRIBUTED PHYSICS ANALYSIS

**Result description:** All necessary elements for distributed physics analysis have been installed and are updated regularly. The Grid aware interface developed by joint effort of Atlas and LHCb experiments has been installed and configured for local users. The users are able to develop and test the applications and to submit production jobs to process large samples of simulated or real data distributed over the various centers.

**Possible market applications:** The system for distributed physics analysis is used for scientific research only.

**Stage of development:** The local installation of tools for distributed physics analysis is stable. The Grid interface and experiment specific tools are continuously improved by dedicated teams of Atlas and LHCb collaborations.

**Collaboration sought or offered:** Exchange of information between scientific institutes involved in the research.

**Collaborator details:** Scientific institutes involved in the research.

**Intellectual property rights:** none.

**Contact Details:** [Henryk.Palka@ifj.edu.pl](mailto:Henryk.Palka@ifj.edu.pl), [Mariusz.Witek@ifj.edu.pl](mailto:Mariusz.Witek@ifj.edu.pl)

#### 4.8. GRID INFRASTRUCTURE FOR TRAININGS

**Result Description:** Procedures for organizing Grid Tutorials are critical for reliability of training infrastructure during the event. Stable environment and support during the course are key factors for a successful hands-on tutorial. During the BalticGrid Project tutorial events we gathered experience on how to prepare training events and wrote technical procedures for that. Although the procedures may be still the subject to update or completion our approach was validated during two successful courses



## FINAL PLAN FOR USING AND DISSEMINATING KNOWLEDGE

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in BalticGrid project. The knowledge and experience can be useful for anyone dealing with organization of training events on grid infrastructure.

**Possible market applications:** It is difficult to find any market application for grid tutorial organization procedures, but we believe they could be exploited by anyone willing to organize tutorial as a technical know-how.

**Stage of development:** We organized two events according to our procedures. After each even we incorporated important improvements to the procedures. Although the procedures may change in future to follow changes in the infrastructure or middleware however they are stable enough to make use of them for a training event preparation.

**Collaboration sought or offered:** Information exchange, know-how sharing.

**Collaborator details:** Grid Tutorial Organizer.

**Intellectual property rights:** public.

**Contact Details:** Marcin Radecki, m.radecki@cyfronet.pl