



BalticGrid Project



Start date: Nov 1, 2005
Duration: 30 months
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Contract no.: 026715
Total expected budget: 3 009 k€
Max Community contribution: 3 000 k€

The Baltic Grid project aims to:

- Develop and integrate the research and education computing and communication infrastructure in the Baltic States into the European Grid infrastructure;
- Enable the formation of effective research collaborations within the Baltic states, Europe and beyond;
- Enable an efficient sharing of computers, instruments and data of high strategic importance to the Baltic states.

The integration of the Baltic States into the European Grid infrastructure will primarily focus on extending the EGEE Grid to the Baltic States. The project will exploit EGEE developments as well as developments in related Grid projects to avoid duplication of effort.

The Baltic Grid project will facilitate the formation of effective research collaborations with scientists anywhere, especially within reach of European Grids. The innovation of BalticGrid is primarily in the area of security, accounting, support for Service Level Agreements, tools for uniform access to Grids and performance engineering of Grid applications. The project will also train and educate providers, administrators and users of Grids in the Baltic States.

The Baltic Grid infrastructure and services will be validated through life sciences, medicine, material science and high-energy physics pilot applications:

- A **High-Energy Physics** (HEP application), including statistical data analysis, production of Monte Carlo samples and distributed data analysis, nuclear and sub-nuclear physics and multi-body problems, will be implemented since computing Grids are of critical importance in this area;
- A **Material Sciences** (MS application), including atomic and molecular structures, modelling of advanced technological materials, will be implemented because of the strategic importance of MS to the Baltic States as well as its substantial computing requirements;
- A **Bioinformatics** (BI application) will be implemented in support of collaborative efforts of scientists in the Baltic States in this highly distributed community, which requires sharing data from many sources and a diverse set of tools.

Baltic Grid will coordinate and collaborate with other Grid efforts in order to:

1. Efficiently provide a coherent training and dissemination programme ensuring sustainable growth of the communities benefiting from Grids;
2. Extend the EGEE infrastructure to the Baltic States;
3. Maximize the set of services available and minimize the human resources required to develop and implement those services.

Training will be carried out through workshops and tutorials at conferences throughout the region and by making material available on the Baltic Grid website. Coordination, collaboration and sharing of materials will be sought in particular with EGEE and ICEAGE. Direct interaction with various communities, including the public, will take place through "Grid Open Days", All-Hands meetings, workshops, symposia and conferences. As the Baltic Grid infrastructure is established, national and regional programs will be further aligned with one another, thus promoting efficiency gains which result from sharing of expertise and human resources. This further alignment and cooperation will be achieved by entities responsible for relevant national programs – either Baltic Grid partners themselves, or institutions cooperating directly or indirectly with those partners.

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List of BalticGrid Activities



Networking Activities

NA1 Management of I3	NA2 Education, Training, Dissemination and Outreach	NA3 Application Identification and Support	NA4 Policy and Standards Development
<p>Overall management and coordination of the project.</p>	<p>The activity comprises two tasks:</p> <ul style="list-style-type: none"> ■ Education and Training – transferring Grid skills from the more experienced Project partners to new participants from the Baltic States so as to ensure the creation of a viable Grid community in these states. ■ Dissemination and Outreach – spreading awareness of the Project to a wider community of users and Grid specialists from the participating countries as well as from other EU Member States. 	<p>The activity will identify application communities for the Baltic Grid and develop support for them. EGEE applications and applications from other Grids will be followed closely, enabling the Baltic Grid to be used for the LHC needs or in any other large-scale computational undertaking. NA3 focuses on applications from material science, bioinformatics, and high-energy physics. An Application Special Interests Group will be formed as a framework for developing new successful Grid user communities. Application support and performance evaluation activities will also be carried out.</p>	<p>The objectives of this coordination activity are to foster the development and use of a set of coherent policies by active participation in the work of the e-IRG and other bodies focused on Grid policies and practices, and by contributing actively to standard setting through participation in GGF Working Groups.</p>

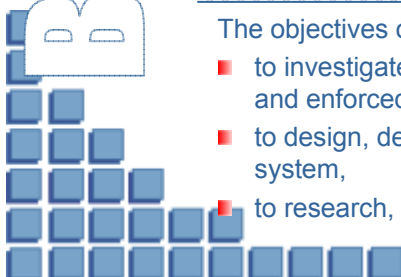
Specific Service Activities

SA1 Grid Operations	SA2 Network Resource Provisioning
<p>This activity aims to build, operate and provide user support for the test and production-level Baltic Grid infrastructure, and to integrate it into the existing European Grid infrastructures such as EGEE and DEISA. Baltic Grid will also integrate existing local e-infrastructures, e.g. governmental Pubic Key Infrastructures. It will be open to all users and service providers.</p>	<p>The Network Resource Provisioning activity will capture network requirements collected and analysed by other European projects such as Porta Optica and monitor and model Baltic Grid network use. This activity will also develop Service Level Specifications for network provisioning, and work with network providers to establish Service Level Agreements (SLAs) and monitor SLA adherence. This activity will manage the relationship between the Baltic Grid partners and network providers. The activity will be managed by IMCS UL and carried out in cooperation with participating NRENs, local providers, Nordunet and GEANT.</p>

Research Activity

JRA1 Service Level Agreement Markets and Dynamic Account Management
<p>The objectives of the activity are:</p> <ul style="list-style-type: none"> ■ to investigate, prototype and implement mechanisms for ensuring that SLAs are established and enforced in a standard and secure way, ■ to design, develop and deploy, a non-intrusive, standards-based user account management system, ■ to research, prototype and deploy SLAs in Baltic Grid.

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BalticGrid Participants

The project involves 10 leading institutions from Estonia, Latvia, Lithuania, Poland and Sweden, augmented by CERN. The Polish and Swedish partners have significant roles in EGEE and other Grid projects; CERN – the lead EGEE partner and a partner in many other Grid projects – will ensure good support from several other Grid initiatives.

1. KTH – The Royal Institute of Technology, Stockholm, Sweden

The Royal Institute of Technology is responsible for one-third of Sweden's capacity for engineering studies and technical research at post-secondary level. The acting partner from KTH in this project is PDC. KTH PDC has had solid experience in project coordination and Grid technologies. **KTH PDC is the coordinator of the project.**

2. EENet – Estonian Educational and Research Network, Tartu, Estonia

The mission of EENet is to provide a high-quality national network infrastructure for the Estonian research and educational communities. EENet is a leading partner in the Estonian Grid project. EENet manages the Estonian Grid CA and the Baltic Grid CA. **EENet is involved in all activities of the project.**

3. NICPB – Keemilise ja Bioloogilise Füüsika Instituut, Tallinn, Estonia

NICPB is an autonomous public research institution involved in three EU Framework Programmes and two Grid-related Nordic Programmes. NICPB is a collaborator of the Compact Muon Solenoid experiment at CERN. NICPB is the founder of the Estonian Grid and a NorduGrid partner. **NICPB is the leader of the SA1 activity.**

4. IMCS UL – Institute of Mathematics and Computer Science, University of Latvia, Riga, Latvia

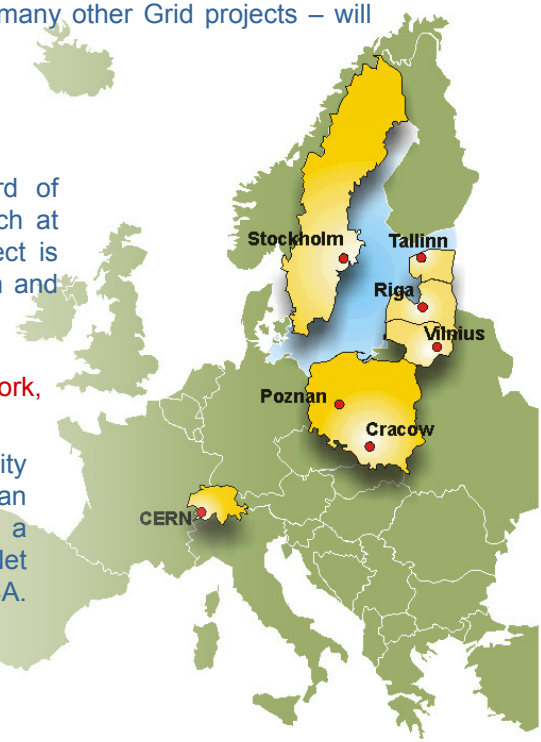
IMCS UL is the leading research institution of mathematics and computer science in Latvia. It is responsible for the GEANT connection to Latvia and provides Internet services for academic institutions. IMCS UL has initiated the creation of the National Grid Centre of Latvia. **IMCS UL is the leader of the SA2 activity** and will provide management of Grid activities, BG certification and registration services in Latvia, user training, and promotion of Grid usage.

5. IFJ PAN – Institute of Nuclear Physics Polish Academy of Sciences, Kraków, Poland

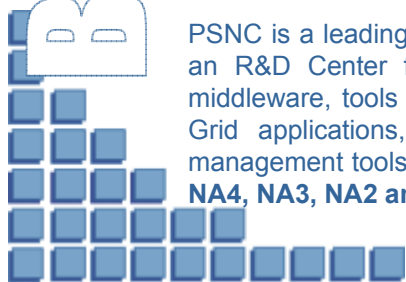
The Institute of Nuclear Physics of the Polish Academy of Sciences is one of the largest research institutions of Poland. In the recent years IFJ PAN has stimulated the development of a distributed computing infrastructure for research in Poland. Since 1993, IFJ PAN has carried out 32 EU scientific projects, and is currently involved in 11 such projects. **IFJ PAN is the leader of the NA2 activity and also contributes to NA3 and SA1 activities.**

6. PSNC – Poznan Supercomputing and Networking Center, Poznan, Poland

PSNC is a leading HPC Center in Poland and a Systems and Network Security Center as well as an R&D Center for New Generation Networks, Grids and Portals. PSNC pursues R&D on middleware, tools and methods for Grid computing, resource management for Grids, large-scale Grid applications, Grid accounting and security mechanisms and policies and Grid fabric management tools. PSNC participates in numerous EU projects. **PSNC contributes to the JRA1, NA4, NA3, NA2 and SA1 activities.**



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7. VU – Vilnius University, Vilnius, Lithuania

Vilnius University, the leading university in Lithuania, is involved in fundamental and applied research in mathematics, physics, chemistry, biology and many other fields. The faculties of Vilnius University involved in this project, are: Faculty of Mathematics and Informatics, Faculty of Chemistry, Faculty of Physics, and Institute of Material and Applied Sciences. **VU is the leader of the NA3 activity and also contributes to all other Baltic Grid activities.**

8. RTU – Riga Technical University, Riga, Latvia

RTUs participation is in three areas: material science investigation, large scale modelling and calculations of advanced building construction with regard to technological materials and solutions. RTU also engages in development of computing infrastructures for research and distance education. **RTU contributes to the SA1, NA2 and NA4 activities.**

9. ITPA – Vilnius University Institute of Theoretical Physics and Astronomy, Vilnius, Lithuania

ITPA is mostly involved in the areas of fundamental physics and astronomy. The problems in these fields are usually very compute-intensive. The researchers are thus eager to access Grids for computing and data analysis, as a good starting point for sustained high effectiveness of IT-aided problem solving. **ITPA contributes to the SA1, NA3, NA2 and SA2 activities.**

10. CERN – The European Organization for Nuclear Research, Geneva, Switzerland

CERN's central role in Grid operations and technology as well as its experience in supporting other initiatives similar to BalticGrid, such as SEE-GRID, is crucial to the project. In BG CERN will contribute to the enabling of Grid technology in the region by support of the set-up, operation and monitoring of the BalticGrid infrastructure. **CERN contributes to the SA1, NA2 and NA3 activities.**



Research areas that are regional, pan-European or global in nature stand to benefit from Baltic Grid. For instance, close to 100 million Europeans live within the Baltic Sea ecosystem. Modelling and predicting marine life, weather, environmental and climate changes and the impact on agriculture of environmental factors is a regional problem with pan-European and even global consequences. The research communities – and, to some degree, even the operational task forces which work with these issues – are regional in nature and their research and operations are supported by sensors and instruments distributed throughout the region. Baltic Grid should therefore be a great asset for initiatives such as GEWEX, Baltex, Baltic21, BOOS and ODON. The high-energy physics community is also global, with main instruments at several locations around the globe, (e.g., at Geneva (CERN), Hamburg (DESY), Batavia, Illinois (FermiLab), Brookhaven, New York (BNL)); hence the need to share data globally and to process and store it regionally and locally. Similarly, the astrophysics community operates a number of exceptional instruments spread around the globe and needs to share and distribute data and processing, but also to synchronize telescopes to form virtual observatories making use of interferometry. Furthermore, Baltic Grid should also facilitate improved healthcare delivery by enhancing the capabilities for remote diagnostics and surgery in specialties where local expertise is not readily available (for instance within the Baltic International Telemedicine Network (BITNET) projects).

more info: www.balticgrid.org

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