The PLGrid Plus Project

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1. Introduction

It's been a year since the start of the PLGrid Plus project [1] (2011-2014): "Domain-oriented services and resources of Polish Infrastructure for Supporting Computational Science in the European Research Space", which is co-funded by the European Regional Development Fund as part of the Innovative Economy program.

The Project is maintained by the Polish Grid Consortium, established in 2007 with the goal to develop the National Grid Infrastructure for science (NGI), matching European standards. The consortium involves five of the largest Polish supercomputing centers: ACC Cyfronet AGH Kraków (Project Coordinator; responsible for international representation), ICM Warsaw, PCSS Poznań, TASK Gdańsk and WCSS Wrocław.

The Project was created to help researchers from different areas of science understand and use the potential of the Polish Grid Infrastructure [2, 3]. The Project supports, by means of IT, Polish research teams in conducting research and also enables extensive collaboration among these teams, as well as international cooperation in the area of e-Science.

2. Domain-specific solutions

The Polish Grid (PL-Grid) Infrastructure was created within the PL-Grid project [4] during 2009-2012 period and is now the basic computing environment for the researchers from different fields of science. Access to computing resources of the PL-Grid Infrastructure is free to Polish researchers and all others engaged in scientific activities associated with a university or research institute in Poland.

The Infrastructure has got currently more than 1100 registered Polish scientists who actively use its vast computing resources − over 230 TFlops of computing power and more than 3.6 PBytes of storage capacity − and submit about 1 million jobs per month.

However, to effectively support, in terms of IT, the development of scientific research in the various problem areas and researchers, it is necessary to fit the PL-Grid Computational Infrastructure to problems being the subject of research. Therefore, the most important task implemented within the PLGrid Plus project is preparation of domain-specific computing environments, i.e., solutions, services and extended infrastructure (including software), tailored to the needs of different groups of scientists.

 The following 13 pilot communities have already been included in the Project: AstroGrid-PL, HEPGrid, Nanotechnologies, Acoustics, Life Science, Quantum Chemistry and Molecular Physics, Ecology, SynchroGrid, Energetics, Bioinformatics, Health, Materials, and Metallurgy (see Fig. 1).
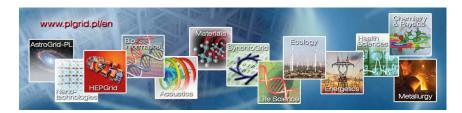
Fig. 1. The list of strategic areas and important science topics supported in the PLGrid Plus project.

Introduction of domain-oriented solutions for these 13 communities opens the scope of use of the Project results to various research groups. However, the scope is not limited to the selected domains. Subsequently, utilising the developed general services and experience in building the domain ones, the integration of new groups will proceed smoothly and at lower cost. Deployment of support and adaptation services, as well as training for those news groups of users are also foreseen within the Project.

3. Computing services

The concept of domain-specific computing environments involves creation and provisioning of a set of specialized computing services that can cover many aspects of the Infrastructure. Examples of categories of such services are as follows:

- integration of specialized equipment that is required in the research,
- integration of domain data, on which calculations are based,
- access to specialized software,
- user support considering common work scenarios, assistance in planning, executing and analyzing of complex, multi-step computing experiments.

With the creation of domain-specific environments it will be possible to:

- go beyond the natural base of users of computing resources and to create interdisciplinary teams that will be able to obtain better scientific results,
- construct, implement and maintain the domain services,
- introduce improvements in the functioning of the PL-Grid Infrastructure.

4. Conclusions and future work

The requirements concerning e-infrastructure coming out from research communities working on the same scientific problem are highly diversified. They also strongly depend on a scientific field. Therefore the PLGrid Plus project fits well with the need of development of an advanced IT infrastructure designed for the implementation of modern scientific research. We think the well-tailored PL-Grid e-infrastructure will not only fulfill researchers' needs but also enable Polish scientific units collaboration with international research organizations in first place.

References

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