DEGISCO

Desktop Grids for International Scientific Collaboration -RI

Summary: The FP7 EDGeS project has successfully set up a production-level distributed computing infrastructure (DCI) consisting of more than 100.000 PCs from several volunteer and low-cost Desktop Grids, which have been connected to existing Service Grids (including EGEE, SEE-GRID, etc. with about 150.000 processors) based on the new 3G Bridge technology and application development methodology. The main aim of the DEGISCO project is the further extension of the European DCI infrastructure that is already interconnected by EDGeS to International Cooperation Partner Countries (ICPC) in strong collaboration with on the one hand local partners in ICPC countries and on the other hand European e-Infrastructure experts (including 3G Bridge know-how) and thus, reinforce the global relevance and impact of European distributed infrastructures. The dissemination and training activities will promote via various channels such interoperation between Desktop Grid and Service Grid infrastructures on a global scale, which leads to more awareness under the general public of computational science and distributed computing co-funded by the EC. As a result more citizens, students, and companies are expected to donate resources to scientific purposes. As part of these activities an International Desktop Grid Federation will be operated allowing for effective exchange of information through participation.

Objectives:

Main objective: Expand European DCIs into ICPC countries by supporting the creation of new Desktop Grids for e-Science in those countries and in Europe and by connecting them using the EDGeS bridge technology. Support applications on this expanded infrastructure, disseminate, promote and provide training about this expanded infrastructure and its usage.

1) Enable the existing EDGeS combined infrastructure (involving Desktop Grids and gLite-based Service Grids, including EGEE, EELA2 and SEE-Grid) to continue expanding internationally into ICPC countries
2) Create an International Desktop Grid Federation as focal point for DCI operators and Application developers. This will be open for individuals and for organisations in research and industry. The federation will be an expansion of the already existing EDGeS Industry and User Forum
3) Based on mutually harmonized policies, provide access for research communities to this e-Infrastructure with hundreds of thousands of nodes, particularly via scientific gateways. Provide recommendations on how this can be achieved
4) Support the coordinated maintenance and operation of middleware software and tools (DG-SG bridge, DG Servers, special VOs, repositories, scientific gateways) by establishing a new expert group/center of operators, administrators, and middleware developers
5) Attach new Grids to the distributed infrastructure applying the newly elaborated best practices, road maps and policies, which will be continuously enhanced based on the monitoring and assessment of the processes
6) Define methods (based on standards and best practices) that can support end-users and the porting activities of new applications to the Grid with special focus on regional/2ndlevel helpdesks, the infrastructure specific application validation procedure in collaboration with ETICS (or similar) service providers, and the maintenance of repository
7) Promote and disseminate the use of Desktop Grids, Service Grids and the use of EDGeS connected infrastructure at regional (NGI) and annual global (EGI, OGF) events
8) Set up and maintain collaborations with other existing and emerging Distributed Computing initiatives, application porting groups, and industrial partners with e-Science background
9) Provide feedback and recommendations to the EC, to the NGIs, and to funding agencies and other stakeholders also in ICPC countries, regarding the establishment and operation of EDGeS-like infrastructures in most sustainable ways, especially when multiple countries are involved.

Action plan: The Workplan is designed to maximise knowledge transfer to ICPC countries with the aim of installing local infrastructures connected to European e-infrastructures and with applications ported to the combined infrastructure. Hence we have defined the following work packages:

WP1. Management: Management of the project.

WP2. Infrastructure support: This work package is designed to technically support the setting up and operation of new desktop grids, especially in ICPC countries. Both local desktop grids, inside organisations such as universities and research institutes, and public volunteer desktop grids will be supported. This work package will provide and support desktop grid related software distributions (such as the SZTAKI BOINC distribution and XtremWebHEP-E distribution), and will assist with their installation and the provision of technical support during their operation.

WP3. Application support: The Application Support Service activity of the EDGeS project has ported and deployed over 20 scientific applications utilised by European user communities to the combined SG/DG platform. These applications are available for use in ICPC countries. That activity has also developed a generic application porting methodology and documentation framework (EADM – EDGeS Application Development Methodology) to support the migration of applications to EDGeS. The major aim of WP3 is, by building on the above results of EDGeS, to identify user communities in ICPC countries, and support them in porting, validating, deploying and operating their applications on the SG/DG infrastructure.

WP4. Communication, dissemination, and community management: WP2 and WP3 provide the technical environment for the combined European- ICPC DCI infrastructure. WP4 is designed to create awareness amongst all possible stakeholders, to recruit new resource providers, new grid operators, new application developers, and new scientific users. It will also disseminate project results and provide training. An important activity will be the creation and further development of a community (based on and in collaboration with) the existing the EDGeS Industry and User Forum. The community will allow stakeholders to exchange experiences. It will also be a focal point for dissemination activities. The community will get the form of an International Desktop Grid Federation.

User communities: DEGISCO works for all kinds of user communities, including physics, chemistry, biology, etc. The user communities must be in need of large amounts of computational power.

International aspects: The project will support the creation of new Desktop Grids in ICPC countries and the connection of these Grids to European DCIs and existing Service Grids in ICPC countries by employing 3G Bridge technology. Moreover, building on the solid expertise of the DEGISCO partners, the project will provide recommendations on best practices and define joint roadmaps for ICPC countries and Europe. The application support activities of DEGISCO support the use of the already two dozen ported applications on new connected DCIs in ICPC countries and support new applications.