

BEgrid, the BELNET grid initiative

Grid computing is a new form of distributed computing that is enjoying worldwide attention. BELNET, the Belgian research network, took the lead in developing a Belgian computing/data grid and created BEgrid. BEgrid, the Belgian grid infrastructure and corresponding services, puts Belgium on the grid world map.

BEgrid started in February 2003. Its goal was to provide a platform for stimulating grid projects in Belgium, principally among the research community. The decision for this initiative was taken after the development of the multi-gigabit BELNET research network. The availability of a powerful network is indeed an important requirement for setting up a computing/data grid. The BEgrid data/computing grid grew out of this initiative.

BEgrid Architecture

BEgrid currently consists of some 400 computing elements and 3 terabytes of storage capacity and continues to grow. This computing and storage capacity is distributed across the various project participants:

- The Centre d'Excellence en Technologies de l'Information et de la Communication
- The Facultés Polytechniques de Mons
- The KU Leuven
- The University of Antwerp
- The University of Ghent
- The Université Libre de Bruxelles
- The Vrije Universiteit Brussel
- The Flanders Marine Institute

BEgrid Middleware

Good middleware is the key to grid computing success. This is the software that integrates the various computers and allows users to easily access the grid. BEgrid uses the EGEE (Enabling Grids for E-sciencE) production grid as grid middleware. EGEE is a project supported by the European Commission to develop a 24/7 worldwide grid infrastructure in the service of scientific research. The BEgrid participants currently use gLite, the latest version of the EGEE middleware.

Applications using BEgrid

Various applications are now being tested or are running in semi-production on BEgrid. Among these are applications in the fields of the High Energy Physics (CMS, AMANDA), astrophysics, hydrology, medical imaging, mathematical calculations (Mathematica, Octave), etc.



BELNET contributions to BEgrid

BELNET is participating in BEgrid at various levels:

- BELNET is the "Certification Authority" for BEgrid and European grid infrastructures. This means that BELNET certificates allow users to access BEgrid. These BELNET grid certificates are also valid at European level,
- BELNET has allocated two part-time positions to operating and expanding BEgrid,
- A CPU cluster at BELNET handles the principal central grid services required to connect to BEgrid,
- BELNET organises introductory courses on the use of BEgrid,
- BELNET is represented in international grid initiatives (e-IRG, NGL,...),
- And of course the BELNET GigaNet network is an important BEgrid building block.

Interest in Flanders for BEgrid

The Flemish government was interested in BEgrid from the start and decided to participate in this project by providing the computing and storage capacity required to allow a maximum number of researchers to make use of BEgrid.

More information on grid computing and BEgrid can be found at the BELNET grid website:
<http://grid.belnet.be>

For more information on BEgrid or for possible participation in the project you can contact the Grid Coordinator at BELNET: +32 (0)2 790 33 33 or via e-mail at grid@belnet.be

More information on BELNET can be found at our website: www.belnet.be

If you have questions concerning these or other BELNET services, feel free to contact our Customer Relations Department (free of charge) at 0800 90548 or via e-mail at customer@belnet.be

BELNET customers can access the support site where more technical details can be found on these and other BELNET services:
<http://support.belnet.be>

BEgrid and grid computing in Europe

BEgrid is affiliated with the European project EGEE. There is also a bilateral agreement between BEgrid and NLgrid allowing researchers from both countries to share a part of their grid infrastructure.

What is grid computing?

"Grid computing" is a technique that links computers worldwide in order to execute tasks that demand extensive computing power and/or require the processing of large amounts of data. The general principle of grid computing consists in establishing networks that link geographically distributed computing power and storage capacity, and make these resources available to various user groups. The equipment needed for this can be owned and managed by a wide variety of organisations. Each user has access to all or part of the resources (computing power, memory, software, data, etc.) that the other members have contributed to the network. It represents a globalisation and virtualisation of computer infrastructure. When storage elements are added to the computing elements, we can speak of a computing/data grid.

Software is needed to implement a computing grid. This software ensures that all the systems - and their properties - that make up a grid at any one moment are known. There must be a distribution system to allocate the free capacity to users who request resources. Rules must also be defined to possibly limit a given user's access to a part of the grid or to give priority to a certain group of users. Security provisions must also be put in place when granting access to the grid.

Grid computing is not yet a standard product on the ICT market. In most European countries and in a European context most grid projects originate in the research world. Computer manufacturers, however, have also begun developing grid software.