

Internet to SuperNet

UK spearheads the next generation of computing power

The UK is to be a major contributor to a European wide initiative to develop and implement an advanced global computing network designed to analyse, process and distribute massive amounts of data far in excess of that capable by current World Wide Web [www] standards. Known as the DATAGRID and regarded as the precursor to the next generation Internet, it will revolutionise our ability to access and manipulate vast amounts of information.

The European Union [EU] has awarded a 9.8 million Euros [£6.2M] contract to a consortium of organisations of which the UK's Particle Physics and Astronomy Research Council [PPARC] will spearhead the British involvement and lead on several key technology areas.

Prof. Ian Halliday, PPARC Chief Executive, said, " The DATAGRID will be a watershed in information technology which will revolutionise scientific research, e-commerce, and our society. Just like the World Wide Web before, which was also invented by a British particle physicist, UK scientists are right at the heart of this technology".

The DATAGRID will create an extensive network, or grid, of unprecedented power and capability. It will harness computer-processing power well beyond current levels and couple this with a unique data manipulation and distribution network never seen before. In a similar manner to electricity, end-users will have access to vast computer processing and distributed power without any regard as to who, how, or from where the power and information is coming from – hence the analogy with the electric power grid, instant and unlimited energy, or in this case computing power, 'at the flick of a switch'.

The EU DATAGRID project is being co-ordinated through CERN, the European Laboratory for Particle Physics research based in Geneva, in which the UK has extensive scientific involvement through PPARC.

Independently of the EU project CERN and PPARC are currently developing a GRID of their own to handle and distribute the massive amounts of data that will be generated by an Early Universe simulator experiment now being built and due to come on stream in 2005.

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The Large Hadron Collider [LHC], an atom smashing machine designed to understand the structure of matter, will generate volumes of data equivalent to every person on Earth making 20 telephone calls simultaneously, or a mile-high pile of CD ROMS! The scientific information from this experiment will have to be distributed to over 1000 scientists in 50 countries.

“ The LHC provides us with a real DATAGRID application”, said Halliday,” for which we are developing novel software to mine, process, analyse and distribute the resulting data - hence the UK’s major involvement in the EU project”.

PPARC recently received science funding from the UK government of £26M over three years for two specific e-Science projects. The LHC data information GRID [already mentioned] and the ‘Astro-Grid’. The Astro-Grid will create a virtual astronomical observatory by combining vast amounts of astronomical data and images from a range of ground and space based telescopes and instruments and distribute that data to a network of research scientists.

Notes for editors:

1. The six main partners in the DATAGRID project are:
 - CERN – The European Organisation for Nuclear Research near Geneva consisting of 20 member states including the UK.
 - PPARC – The Particle Physics and Astronomy Research Council, the UK’s strategic science investment agency.
 - CNRS [France] – Le Comite’ Nationale de la Recherche Scientifique.
 - ESRIN – The European Space Agency’s Centre in Frascati, near Rome, Italy.
 - INFN [Italy] – Istituto Nazionale di Fisica Nucleare.
 - NIKHEF [The Netherlands] – The Dutch National Institute for Nuclear Physics and High Energy Physics, in Amsterdam.

Alongside the 17 pan-European research organisations in the project, three companies are associated partners of the collaboration:

- IBM-UK, Feltham – The High Performance Computing Unit of IBM
- CS-Systems D’Information, Clamart, France – a company that provide computer services and products for the Internet market
- Datamat, Rome, Italy – A company that provide computer services for a large set of applications and high performance computing requirements

There is also an Industry Forum, which will bring together research institutions and companies from around the world with the objective to develop open Grid technologies ensuring a seamless non-proprietary Grid for all.

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2. The DATAGRID project was first submitted to the EU on 8 May 2000, and after a successful review the consortium was invited to negotiate a contract for 9.8 million euro of EU funding over three years. Negotiations were concluded in October 2000 and the formal approval and signature by the EU took place on the 29 December 2000.
3. The DATAGRID project will develop and implement a novel distributed computing environment, which is specifically designed to analyse and move vast amounts of data. It will build on emerging GRID technologies, using 'open source' code to create a new world-wide data and computational Grid on a scale not attempted previously, a **World Wide GRID**.
4. The resources will be made available transparently to a widespread community through layers of new 'middleware', the really innovative part of the DATAGRID project. 'Middleware' could be described as software 'glue', which sits between the computing operating systems and the applications, enabling collaborative working in new ways. A major activity of the DATAGRID project will be the dissemination of information and experience, with a strong emphasis on ensuring that the 'middleware' created is made available to industry, potential partners and research areas.
5. The DATAGRID project will provide scientists around the world with flexible access to unprecedented levels of computing resources and will initiate a new era of e-science. It will enable next generation of scientific exploration using shared databases up to a Petabyte in size [equivalent to the data contents of a pile of CD ROMS standing about a mile high], across widely distributed scientific communities. It will allow distributed data and CPU [Central Processing Unit] intensive scientific computing models, drawn from the scientific disciplines of physics, biology and the earth sciences, to be demonstrated on a geographically distributed Grid.
6. The Central Laboratory of the Research Councils (CLRC) incorporating the Rutherford Appleton Laboratory (RAL) is a major player in Grid development, particularly for particle physics and astronomy and, along with PPARC, will be making major contributions to the project.

Further information:

The DATAGRID website: <http://www.cern.ch/grid>

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