

# Projects



## The future of **GRID**

Mario Campolargo  
Jamie Shiers  
Werner Vogels  
Plus many more

Dissemination from more  
than 30 EU research projects





Dieter Kranzlmüller, Project Director of European Grid Initiative



Jamie Shiers, CERN

# GRID COMPUTING

Read how the leading faces of Grid computing see the future shaping up following a groundbreaking meeting at the recent Open Grid Forum 23 media conference in Barcelona, which brought together some of the key figures in European Grid research to look at the possible future applications affecting commerce, academia and beyond

**Although Grid computing** represents the cutting edge of modern technology, many of the fundamental ideas which underpin it have a long history. Sharing computer power between users was essential as long ago as the 1960s, a time in which computing was dominated by huge mainframe computers that were shared between employees.

Similarly the idea of computing as a utility has its roots in the same era. In 1965 the developers of the Multics operating system proposed that computing resources be accessed in the same way as essential services, a revolutionary idea that paved the way

for modern advances in Grid computing. While such ideas may be relatively well-established, it is only through the rapid advances of recent times that they have once again become technologically relevant.

Ideas like computing as a utility and power sharing are now integral to the modern vision of Grid computing – a vision that sees it as a means to enable large-scale collaborations and provide researchers with computing power on the kind of scale that is increasingly required to advance knowledge.

Witness the Large Hadron Collider (LHC) based in Geneva, a facility that



Mario Campolargo, Head of Unit, DG INFSO/F3 and GÉANT



Werner Vogels, CTO, Amazon.com

# FACES THE FUTURE

will generate volumes of data well beyond the capability of conventional computers, meaning there is a clear need for researchers to gain access to greater computing power.

The idea of sharing computer capabilities in order to gain access to Grid computing resources is one that excites many, aware as they are of the potential Grid technologies offer in terms of eScience, financial modelling and climate modelling, to name just three of the more prominent applications.

Indeed, the broad relevance of Grid technologies and the depth of interest their development has generated was

further reinforced recently at the OGF23 Media Conference in Barcelona, an event in which a high-profile panel, including participants from government institutions, research organisations and enterprises, discussed the development of Grid technologies and responded to public queries.

The panel members included Mario Campolargo, Head of Unit, DG INFSO/F3 - GÉANT & e-Infrastructures; Craig Lee, President of OGF; Werner Vogels, CTO Amazon.com; Dieter Kranzlmüller, European Grid Initiative (EGI); Santi Ristol, ATOS Origin; Jamie Shiers, CERN; Carlos Henrique de Brito Cruz, the

State of Sao Paulo Research Foundation (FAPESP); and Francesc Subirada, BSC Associate Director. The questions focused on the impact of distributed computing and future trends in EU research and commerce.

The wide range of perspectives they offered reflected the multi-faceted nature of the event and helped give a comprehensive overview of the development of Grid technologies. eStrategies Projects was there to take note of what was discussed by those at the cutting edge of Grid technology.

Of course, with Grid technologies taking on an increasingly important role

within both academic research and the wider business environment, we were eager to question the panel closely and get a sense of how those charged with development saw the future strategic direction of the technology.

Faced by this rigorous questioning on the impact of distributed computing and the future trends in EU research and commerce, the panel were in agreement that ICT can play a key role in tackling the major scientific challenges that we face.

Mario Campolargo described grids as being one of the most important means by which we can empower Europeans to take control of their future in the face of the growing challenge from developing economies. By enabling scientific communities to share computing resources, data, talent and people power significant research advances can be made. In the age of the knowledge economy these are advances which can translate directly into both social and economic benefits.

### EC portfolio

This latter point is one recognised by the European Commission, which has responded by putting in place a significant portfolio of member state-endorsed initiatives.

These initiatives are driving the deployment in Europe of advanced ICT-based infrastructures, infrastructures which are aimed at making the scientific development process more efficient. For his part Campolargo highlighted a number of concrete examples where eInfrastructures have been used to real effect. Satellite imaging helped reduce disaster response times during the recent earthquake in China, while grid technologies have also been used to drive forward in-silico drug discovery to tackle diseases like malaria, AIDS and Bird Flu.

This approach, which has proven significantly quicker and more efficient than using traditional tools, represents an important advance, a point on which Craig Lee concurred. "Creating sustainable infrastructures is the key to grid computing," he said. "Grid computing can help with hurricane forecasting and other climate modelling projects."



**Grid concepts from big science will ultimately cross over to the wider community when general computing requirements are met by web services**

Craig Lee, president of OGF

Of course, while clearly of enormous potential, work in drug discovery is far from being the only possible application of Grid technologies. Grid has empowered communities, both across Europe and globally, by giving them equal access to data. This helps prevent 'brain-drain', as scientific research can be funded and undertaken locally. From a financial viewpoint, funding bodies can invest in local research initiatives, which can also lead to international partnerships.

This is a point reinforced by Jamie Shiers of CERN, part of the team that has developed the Large Hadron Collider (LHC) computing project, for which a readiness challenge has recently been conducted. "The people behind the LHC are highly motivated, as applications

on the LHC will help tackle key issues, such as disaster response and flood prediction," says Shiers.

This is an approach that has been replicated in a number of other areas. European researchers have established partnerships with their counterparts in many different parts of the world so as to be able to provide rapid support when necessary.

These partnerships draw on expertise and human knowledge that exist only in certain parts of the world, thus creating centres of excellence in specific fields. Many observers have suggested that this approach gives us the best possible chance of responding quickly and effectively to unexpected events, a view echoed by

Dieter Kranzmueller, who highlighted the human aspect of grid computing and how it brings together people with specific skill sets, thus allowing them to share resources and knowledge to tackle key issues of mutual interest. The new goal is to come up with a long-term plan to ensure the sustainability of the infrastructure.

However, if these collaborative partnerships are to be truly effective it is clearly enormously important that all parties share a vision for the future of Grid computing. European researchers can be reassured that there is no lack of enthusiasm for Grid computing outside their own continent.

Take Carlos Henrique de Brito Cruz, who is convinced that grid computing offers real opportunities for collaboration between scientists in Latin America, Europe and the rest of the world. Cruz recognises that Grid computing lends itself very well to tackling the key challenges that Brazil faces, such as Biodiversity – which generates huge amounts of data – and climate change, with specific reference to the Amazon rainforest.

The global implications of climate change illustrate the value that international partnerships can add and the importance of raising awareness, both areas in which Grid technologies can play a significant role.

This demonstrates that, far from being an abstract concept with no immediate relevance to the lives of ordinary people, Grid technologies are well capable of addressing key contemporary issues, something that a number of attendees at the conference were keen to pick up on.

Francesc Subirada argued that the Grid has a large part to play in improving energy efficiency, and pointed to a number of European initiatives aiming to reduce power consumption at various levels of the IT infrastructure, such as the IT architecture, IT systems, components and sites.

“If we do not significantly reduce the power needed to run any kind of computer then we will reach the point where energy costs are higher than the cost of a computer,” said Subirada. The reasons for doing so are not only ecological but also economical, something in which every nation has a vested interest.

This last point reminds us that if distributed computing is to reach its full potential then the needs of business must be taken fully into consideration, something to which those in the Grid development field have responded. Grid technologies are a crucial element in the goal of ‘greening’ IT, while they also have great potential in enabling the development of novel technologies. Furthermore they can provide power tools to any industry that uses modelling and simulation, as well as the creative industries, pharmaceuticals, biotech firms and financial services, to name just a few.

### Boosting European business

These practical benefits show that Grid technology is now in a stronger position than ever before to play a central role in boosting European business. This was a point on which Santi Ristol from ATOS Origin, the co-ordinator of the BEinGRID project, was keen to expand.


He highlighted the project’s work in analysing 25 businesses, work which involved evaluating their needs and assessing the features that help them offer more efficient services, all with the overall aim of gaining a better understanding of the role grid plays in delivering business benefits. The project

embraces end-users from diverse sectors, something that it views as being key to assessing those needs and demonstrating the tangible benefits Grid technologies can bring.

These are benefits increasingly recognised in the higher echelons of business. Take Werner Vogels, the Vice President and CTO at Amazon.com, responsible for driving the company’s technological vision of enhancing global innovation. Summing up the main impact of Grid technologies on the commercial sector, Vogels cited the improved availability of the right IT resources and the faster worldwide delivery of products and services, which is crucial to predicting the kind of resources we will need as we move forward, and reiterated his belief that clouds offer access to raw resources, whereas grids provide higher level services.

His keynote speech, immediately after the media conference, was peppered with lively examples of on Web Services (AWS) success stories, where customers have coped with surges in demand or performed multiple one-off tasks using AWS. The goal was to reduce the complexity of related technologies and enable the faster delivery of results, a goal which could well widen the user community of Grid technologies even further.

Indeed, the impact of distributed computing in both the scientific and business worlds has been such that it leads us to consider whether or not it will catch on in the public arena. In Craig Lee’s mind Grid concepts from big science will ultimately cross over to the wider community when general computing requirements are met by web services. Non-experts are likely to use distributed computing resources with user-friendly tools, though they may not even realise that that is what they are doing! After extensive discussion and intense debate on a wide range of topics the Barcelona panellists agreed that increasing end-user engagement is key to increasing the adoption of Grid technologies outside the scientific domain, and ultimately by the wider community. Europe has invested in the development of a sustainable model. It is now time to shape that model and push forward a sustainable infrastructure. ★



**Further reading**

For more on the greening of IT using Grid technology, turn to page 68 for news of a new initiative launched at the OGF23 Media Conference

# Dissemination partnerships

The success of any research project depends on its ability to bring its results to the market place, so letting the right people know how these results have been achieved and, more importantly perhaps, how these results would have a positive impact on their business or organisation in terms of profit, efficiency or improved service.

The problem for many research teams, however, is that not only is there a lack of resource to communicate this message effectively, but there is often also a lack of real expertise in presenting the information appropriately to both commercial and technical audiences.

Through FP7, the problem of resourcing this dissemination has largely been solved due to funding being made available specifically for this purpose.

British Publishers solves the other half of the problem facing research teams by providing a communication strategy that incorporates the following:

- Highly effective methods of informing stakeholders and the wider public about your project, its aims, methods and achievements. This is an ongoing process throughout the life of the project.
- Transforming your scientific research papers into easily accessible documents that can be understood by policy makers and commercial targets. This will mean writing and editing project material into a style more readily understood by the widest possible audience.
- Creating attractive documents, leaflets, newsletters and brochures that show the project, its members, partners, methods and achievements in the best possible light, both online and in hard copy format. These can be used for inhouse dissemination and communication, dissemination at targeted conferences and workshops and dissemination to potential commercial partners.
- Broadening the project's network. A vital aspect of every project is communication between partners and other associated industry and



research groups and, by creating an online environment for the exchange of documents, directories and subdirectories, this communication is enhanced.

- Creating a website that acts as an effective window on to the project, its work, its contacts and its results. This must be scalable to incorporate growth in project material and dynamic to reflect this work in the best possible light, creating an up-to-date first impression for both partners and a wider audience.

British Publishers will be involved in all aspects of this strategy from the outset and for the lifetime of the research project.

## **An example of a British Publishers Project Partnership**

Every partnership is different, with different projects approaching dissemination activity in their own way. British Publishers offers a bespoke service in this regard and will tailor every partnership to the individual needs of each partner. This is a typical example of the sort of work we can do, while additional services can be offered if required.

### **Website**

British Publishers will design and build a new website for the project. This work will be carried out at the start of the project and the site will be active within the first three months.

The website will be dynamic and fully scalable to cope with the growing amount of material, both live and archived, that will accumulate throughout the life of the project.

The website will be designed to contain all the relevant information about the project itself – its aims and objectives, how it is organised, its partners and collaborators, milestones as they are reached and contact information.

It will also deal with the thematic focus of the project, dealing with the current situation and why this research is important, how the work is being carried out and by whom, the policy for the development of the project and operational processes. This will also take in the solutions side of the work – what solutions are proposed for certain problems, innovations, developments and demonstrations.

The website will also contain space for professional content elaboration in the form of graphics, sound and information.

The second tier to the website will be for project members and those taking part in the research work. This will be password protected and be in the form of an intranet. This area will be used exclusively for the exchange and archiving of research documents, graphics, pictures and ideas as well as the management of essential documentation for the project. This will require a large data capacity and can be built at the same time as the rest of the site, or bolted on at a later stage.

### **Leaflets**

British Publishers will write, design and print all project leaflets and make them available as downloadable documents from the website. We can also handle the distribution requirements.

### **Brochures**

British Publishers will write, design and print all brochure material throughout the life of the project. These brochures will outline the essential developments of the project work and will be printed on

high-quality paper. The brochure will be used for targeted dissemination purposes and British Publishers will coordinate the distribution to selected recipients directed by the project coordinator. The brochures should also be used at external meetings and workshops attended by potential commercial partners and stake holders as well as at project workshops. Quality will be key here, both in terms of design and content. The brochures will also be available on line in PDF format and downloadable from the website.

### **Newsletter**

It is important to keep all relevant parties fully up-to-date with the progress of the project. British Publishers will produce a regular project newsletter outlining all the latest developments, highlighting events as well as outlining who's doing what and when. These can be sent out via email, be made available on the website or a small number can be printed to be distributed via direct mail.

### **Press releases**

British Publishers will write the initial press release announcing the start of the project, its aims and objectives. This is an important process and can be continued throughout the life of the project to announce significant developments and milestones. We can also foster media connections (See PR)

### **Workshops**

British Publishers has considerable experience in organising and hosting events around the world. We will use this experience to organise Project workshops as and when directed. These will be lively, vibrant events for the audience of experts, stakeholders, customers and the public sector.

British Publishers will:

- Locate and hire a suitable venue
- Arrange for all services to be supplied on site. These will include projectors, screens, sound equipment etc.
- Arrange for the filming of keynote addresses at the event, then hosting the webcast on the website for further dissemination.
- Arrange for all delegates to receive suitable refreshments on the day.
- Pre-promote the event using both PR and traditional advertising to generate a suitable audience.
- Work with the project coordinator and relevant partners to establish a workable and interesting agenda for the workshop
- Establish a relevant invitation list that will be most effective for generating the most interest and commercial possibility.
- Send out the invitations (via email) or on the phone, and then follow up to guarantee attendance.
- Make sure all material from project partners is included in all printed and web-based documentation.
- Look after all post-event dissemination, using video, sound and print to get maximum publicity for the project and ensure that all relevant partners, customers and other see, hear and read about the workshop.

British Publishers can also organise smaller, more intimate events in the form of roundtable discussions. These would bring together experts, both part of the project and external, buyers, customers and public sector decision makers for debate and discussion in front of a lively audience. These events prove very effective in bringing the right people together on the sort of scale where decisions can be made.

### **PR**

British Publishers can look after all PR commitments for any project, communicating with relevant media when necessary and getting additional publicity for project results and activities when necessary. This is a useful way of keeping the work "in the public eye", making future commercial application far more likely.

# Project roadmaps

British Publishers also works with projects on the production of individual roadmaps, working with the client to produce the right type of document for their individual requirement.

This will usually mean reviewing and editing existing scientific material and presenting it in an attractive format that is informative, relevant and readable to both a scientific and non-scientific audience.

We will produce a short abstract of the document, outlining briefly the aims, objectives and results of the project to date. Once this has been agreed, we will usually publish this in eStrategies Projects Magazine as part of the agreement.

Following the abstract, British Publishers will produce the full roadmap, editing the material, researching and sourcing imagery, creating graphics where necessary and looking after all design and production requirements.

We are used to working closely with clients and partners, so will stay fully connected with the project throughout the process, until the final document is produced that satisfies the client brief.

British Publishers will produce a version that can be uploaded on to the project website, a PDF version that can be sent via email to the project's database and a full print version that can be distributed via post or through conferences.

We will look after all aspects of the print and distribution process, working with our print works to keep costs to a minimum.

