

Belief, how European e-Infrastructure makes a difference (w/ Video)

September 7 2009

Europe has turned its early belief and investment in the potential of e-Infrastructures and virtual research into a position of great strength, especially in e-Science and grid technology, such as the GÉANT network dedicated to research and education.

The European Belief-II project is working to ensure that Europe maintains and strengthens its position as a major e-Infrastructure provider in the world.

But before we learn how Europe has achieved its strong position in this field, let's try to understand a little better what e-Infrastructure really means.

One possible definition: Electronic or 'e'-Infrastructure is an environment where research resources (hardware, software and content) can be readily shared and accessed where necessary to promote better and more effective research. Such environments integrate hard-, soft- and middleware components, networks, data repositories, and all sorts of support enabling virtual research collaborations to flourish globally.

As definitions go, this is a good one, but e-Infrastructure can mean more than just wares and networks. The way human being's interact around these facilities - sharing, federating and exploiting the collective power - is also important. In this sense, the EU sees e-Infrastructures (ICT Infrastructures for e-Science) as new research environments enabling researchers in any manner of discipline and any location to carry out

modern research or e-Science.

Partly due to the complex cross-border nature of e-Infrastructures, and perhaps because of the “framework” approach to research funding, Europe has become an experienced pioneer in e-Infrastructure projects, big and small.

Vast remit

The 24-month Belief-II project follows the earlier and successful Belief (Bringing Europe's eLectronic Infrastructures to expanding frontiers) project which was supported by the EU's Sixth Framework Programme (FP6) for research. Now supported under FP7, Belief-II is an example of how European forward thinking is paying dividends.

Belief-II is building on achievements and momentum created by its predecessor. Its work includes communicating the results, networking and promoting knowledge flow between EU e-Infrastructure projects and their users, promoting their development and exploitation globally.

This is a vast remit but it needs to be because e-Infrastructure, by its nature, is a very big area. “It massively increases research capacity,” confirms Stephen Benians, coordinator of the Belief-II project. “And of course, that has a wide range of potential benefits, from economic competitiveness to enhanced health and learning benefits in the developing world, to aviation engineering products, social sciences and culture.”

There are over 60 projects currently (summer 2009) working on different aspects, or different types of e-Infrastructure, according to Benians. “So we were needed to help spread ideas that originated in one project to others who could benefit - maybe in totally different domains - and thus boost innovation.”

Benians describes four layers to e-Infrastructures. There is the underlying bandwidth, the enhanced internet access enjoyed by European researchers thanks to the GÉANT2 initiative. GÉANT2 has just been upgraded and now offers blinding speeds.

Intricate designs

At this speed, researchers can realistically cooperate on very large datasets, complex problems or intricate designs, and it means that videoconferencing and even virtual reality interaction are possible. That is the first layer.

Then there is the hardware and software that runs the grid computing systems at the heart of current research. “The idea was to give researchers access to the power of supercomputers, or thousands of PCs, through their desktop computer in their office,” clarifies Benians.

The third layer of modern infrastructure is the data, the area where the greatest value is created. Finally, there is the ‘perspective’ of global virtual collaborative research environments, where researchers can collaborate closely and efficiently no matter where they are in the world.

Belief-II’s job was to help players in the e-Infrastructure space, spread across dozens of different projects, to link up and create new projects, or prioritise the research agenda. “We have helped create new projects and gave momentum and platforms to ideas by, for example, introducing different partners [to each other],” says Benians.

Recently, Belief-II linked up the European Space Agency and Genesi-DR, a Seventh Framework Programme e-Infrastructures project offering open and seamless access to Earth science digital repositories for European and worldwide science users.

They are seeking to establish a set of criteria or guidelines for marking up data so that it is more easily traced to its origins - the data's provenance. This, Benians tells ICT Results, is important because it helps those who use the information understand the context behind it, or the reason why it was created.

“This will have a long-term impact. The data will remain useful even in 30 years’ time, because researchers can be confident of where it comes from,” he explains.

Knowledge broker

But the majority of Belief-II’s work is acting as a knowledge broker. “This is not about simply sticking some information on a website. We are very hands on. Months before we actually hold a meeting, we will organise a forum so participants at the meeting can discuss their goals and needs before the meeting takes place,” Benians reveals.

The project thus prepares the ground and greatly enhances networking opportunities, because participants will already ‘know’, in a sense, the people they are meeting. This is a lot about networking. Belief-II’s goal by the end of the project in April 2010 is to have organised three ‘e-concertation’ meetings, two brainstorming sessions and three international symposia on three continents. It is a solid output.

Additionally, Belief-II has created a digital library for e-Infrastructures, developed fora, published an e-Infrastructure guide, pursued joint communications efforts, such as a DVD presentation, a professional quality video on YouTube , an e-Infrastructure publication, called Zero-in, and contributed to various European Commission publications.

Strong programme

It is a very strong work programme, and it has many direct benefits, such as the digital provenance standards project recently set up. Other benefits include developing a policy document for Indian and European policy-makers, highlighting the priorities and user needs for e-learning.

European Commission funding priorities are also informed by the contacts and feedback routed through the Belief-II project, and this ensures that funding is going towards real needs for European [infrastructure](#).

There is also a very large international dimension to Belief-II, with participants from five continents and partners in Brazil, South Africa and India. “These are strategically important regions for Europe, and they are very dynamic in certain research communities, like astronomy in Brazil and software and services in India. They have a lot of great data so everyone benefits.”

Resources for real needs

Africa, too, is the fastest growing region for e-Infrastructure development and deployment, in part because it is starting later. Nonetheless, it remains very dynamic in this area.

Importantly, Belief-II also tracks supply and demand of e-Infrastructure resources, informing European researchers of needs abroad and informing the international audience about European innovation.

Belief-II is helping to create projects, broaden public understanding of the importance of e-Infrastructure, foster relationships between projects nationally and internationally, and it ensures that research and resources are targeted at real needs not replicated effort.

In all, [Europe](#)'s continued success in the e-Infrastructure space is in good

hands.

The Belief and Belief-II projects have received research funding from the EU's Sixth and Seventh Framework Programmes respectively.

More information: www.beliefproject.org/

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Citation: Belief, how European e-Infrastructure makes a difference (w/ Video) (2009, September 7) retrieved 27 April 2024 from <https://phys.org/news/2009-09-belief-european-e-infrastructure-difference-video.html>

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