Grid TALK GridBriefings
Grid computing in five minutes

Sustainability for the future: The European Grid Infrastructure (EGI)

On 1 May 2010, under Director Steven Newhouse, EGI took over the coordination of European grid infrastructure. Through the previous DataGrid and Enabling Grids for E-SciencE (EGEE) projects, researchers across the globe reaped the benefits of grid technologies. Now EGI.eu, the organisation established to coordinate EGI, hopes to continue this trend. Although EGI marks a change from short-term funded projects to a long-term service, for the first four years EGI.eu will be financially supported by the European Commission funded project EGI-InSPIRE. EGI will need to develop strong coordination, engage with user communities and forge links with other providers if Europe is to retain its competitive edge in the global landscape of e-Infrastructures.

The history of EGI

Confirmed sustainability for grid infrastructures has been recognised as one of the key factors for greater adoption of grid technologies. In September 2007 the European Grid Initiative Design Study (EGI_DS) began, funded by the European Commission (EC) in order to plot a course towards an ongoing e-Infrastructure for Europe. The resulting 'Blueprint for a European Grid Infrastructure' proposed a grid based on National Grid Initiatives (NGIs), complemented by an organisation, EGI.eu, which provides international coordination. EGI.eu will not provide any IT resources but will act as the 'glue' enabling coherent access, interworking and accounting between NGIs.



Steven Newhouse, EGI.eu - *"The establishment of EGI.eu represents a new phase for the European Grid Infrastructure. Sustainability is key for supporting the next generation of Data Intensive Science projects that are now in their planning phases. Many will collect data for years, some for decades, and researchers will need access to this data for processing and further analysis for many years after that. EGI, through its foundation on strong National Grid Initiatives, will provide the coordination necessary for a secure, reliable and integrated grid infrastructure in Europe."*

EGI formally began operation on 1 May 2010 and is a collaborative effort, governed by its participants - the NGIs and European International Research Organisations (EIROs) - who will contribute to EGI.eu's running costs. EGI.eu is governed by a Council, which is responsible for providing the long-term direction of the organisation, and the Executive Board, which provides guidance to the Director, who leads the organisation on a day-to-day basis. The EGI Council currently consists of

A new home

February 8, 2010 marked a new era for grids as members of the newly elected EGI.eu Executive Board gathered in Amsterdam to sign the papers that brought EGI.eu into existence.

EGI.eu is a Dutch foundation – a 'Stichting' - governed by statutes decided by its stakeholders in the distributed computing infrastructures community. Stichtings are common in the Netherlands and are used to run research institutes, hospitals and many other non-profit organisations.

Based in the Science Park in Amsterdam, EGI.eu is in good company. The city already hosts organisations such as TERENA, which aims to foster development of the Internet, while the Science Park is home to SARA and Nikhef, organisations which are providing key technical administrative and legal services to EGI.eu during its start-up phase.



Credit: www.sxc.hu

30 NGI members as well as two EIROforum members. Projects included in the European Strategy Forum for Research Infrastructures (ESFRI) Road Map - the EC's initiative to develop the scientific integration of Europe and to strengthen its international outreach - are also invited to contribute to, and benefit from EGI, as is any organisation that subscribes to EGI's objectives.

The road towards EGI

2001	*January*	**European Data Grid project is launched**
2004	*April*	**EGEE begins**
2006	*May*	**EGEE-II takes over from EGEE**
2007	*September*	**EGI_DS begins**
2008	*May*	**EGEE-III begins**
	December	**EGI_DS releases 'Blueprint for a European Grid Infrastructure'**
2009	*March*	**EGI_DS policy board decide Amsterdam will host EGI.eu**
	July	**EGI council is created based around a Memorandum of Understanding**
2010	*8 February*	**EGI.eu is founded**
	1 May	**EGI.eu assumes coordination of European Grid Infrastructure, supported financially by NGIs, EIROs and the EC through the EGI-InSPIRE project**
2014		**EGI-InSPIRE ends, EGI.eu continues to coordinate EGI**

EGI.eu in detail

- EGI.eu is a legal entity based in Amsterdam.
- It will act as the coordinating body and will be responsible for managing and operating the pan-European grid infrastructure.
- Its central role will be to facilitate interaction and collaboration between NGIs of participating countries. It will actively support the establishment of new NGIs where none exist.
- EGI.eu will comprise approximately 20 staff in Amsterdam, with another 25 staff distributed in the community, providing technical expertise and coordination in the following areas:
  - Technology Unit: Assessments of new technologies in order to identify high quality software components for inclusion in the reference middleware stack roadmap and release (see also European Middleware Initiative below).
  - Operations Unit: Coordinating the pan-European production infrastructure putting new technologies into production and ensuring sites are highly available and reliable.
  - External Relations: Policy development, dissemination and community building within the EGI community.
  - User Community Unit: Coordinate and support teams in the NGIs and EIROs and provide tools to support virtual organisations and virtual research environments.

Together EGI.eu and the NGIs will operate and further develop the pan-European grid infrastructure, in order to guarantee its long term availability. The relation between EGI.eu and the NGIs is governed by the subsidiarity principle, meaning that tasks that are more effectively performed at the national or regional level should be left there.

EGI-InSPIRE

In its initial stages EGI will be supported by EGI-InSPIRE, an EC funded project set up to aid the development of the e-Infrastructure in Europe. A €73M project, €25M of EGI-InSPIRE's costs will be contributed by the EC, with the remainder coming from EIROs and NGIs.

In order to finance the EGI activities, EGI.eu will pull together the resources contributed by the EC through EGI-InSPIRE and the membership fees paid by the NGIs and the EIROs. However, these fees will increase over time, reducing the organisation's dependency on EC funding.

EGI-InSPIRE will aid the transition to the EGI model. By the time it ends in 2014, it is essential to ensure that strong independent NGIs are effectively organised through EGI.eu.

Challenges ahead

The transition to EGI will not be easy. Among the challenges which lie ahead are:

• ensuring the NGIs pull together: At the heart of the EGI model are strong independent NGIs. It is vital that the NGIs work cooperatively with each other to develop an integrated and coherent pan-European infrastructure. EGI will monitor the NGIs to ensure their infrastructure meets the agreed requirements.



Bob Jones, CERN - *"EGI is the result of many years of work by many projects. Distributed Computing Infrastructures have matured at an incredible rate if one compares the timelines with those of networks and research infrastructures. In 2000 I think it would have been a brave call to say that Europe will have a sustainable production grid infrastructure built on a federation of national grid infrastructures in place by 2010."*


The EGI council

• **engaging with user communities:** Specialised Support Centres, intended to support various user communities, did not receive funding from the EC during the last call. This places more onus on the NGIs and EGI to engage with communities themselves. Engagement is key if EGI is to develop an infrastructure that is useful and accessible to researchers dependent on the grid.

• **linking with infrastructures in other regions around the world as well as commercial cloud offerings:** EGI must build upon links forged during the EGEE project if it is to create a truly global solution. EGI will also assess the impact of clouds and virtualisation operating models on the community. It will work to understand what opportunities integrating these technologies could provide in terms of improving both efficiency and services.

• **integrating with a separate middleware project:** EGI will work alongside the European Middleware Initiative, EMI, the Initiative for Globus in Europe, IGE, and others to develop technology for grid users. Challenges here include how to ensure the middleware projects deliver the software needed by EGI's users when they need it.

• **decision making:** EGI.eu is a collaborative organisation. Its Council currently consists of 32 members, a number that will expand with time. A well defined governance model is essential to ensure effective decision making processes.

In collaboration with EGI

EGI will work closely with other international grid activities to help expand and serve users across Europe. These include:

• **European Middleware Initiative (EMI):** EMI will be a primary technology provider for grid infrastructure in Europe. It brings three major European middlewares – gLite, UNICORE and ARC – under the same roof, in order to deliver a streamlined middleware solution that inherits the advantages of all three systems and advances the technology further.

• **Initiative for Globus in Europe (IGE):** IGE serves as a comprehensive service provider for the European e-Infrastructures regarding the development, tailoring, customisation, provisioning, support, and maintenance of components of the Globus Toolkit. Activities include continuous measurement of software quality, and operation of a software repository as well as participation in standardisation bodies, training, promotion, and documentation activities.

• **Standards and Interoperability for e-Infrastructure Implementation Initiative (SIENA):** The follow-up project to OGF-Europe, SIENA will contribute to defining a future e-Infrastructures roadmap focusing on interoperability and standards to gain an in-depth understanding of how distributed computing technology is being developed in this context.

• **e-ScienceTalk:** Formally known as GridTalk, e-ScienceTalk is a dissemination project which will communicate the achievements of grid, supercomputing, cloud and networking projects across Europe.

Targeting ESFRI projects

The European Strategy Forum on Research Infrastructures (ESFRI) roadmap projects span social and biomedical sciences, earth and physical sciences, energy, infrastructures and analytical facilities. But despite their variety, the ESFRI projects all have one thing in common: they need to store and analyse vast amounts of data. In the coming years EGI plans to collaborate with the ESFRI projects, expanding the infrastructure to support these communities. To date, the ESFRI projects are all in different stages of maturity. While some have mapped their storage, data and processing requirements, others are still working towards this. EGI can offer support in a variety of ways, from consultancy to helping the ESFRI projects become expert users of the infrastructure.



Dieter van Uytvanck, CLARIN (an ESFRI project) – *"We are looking forward to a productive cooperation with EGI. Connecting the digital language repositories and the related web services to the grid infrastructure certainly is not a trivial task but in the end it hopefully will deliver interesting results for the eHumanities community."*



Alberto Di Meglio, EMI - *"EGI has a very important mission that will allow a growing community of researchers to produce revolutionary scientific results, creating efficient multi-disciplinary collaborations in many branches, from life sciences to high-energy physics, from material sciences to earth and environmental sciences. EMI is committed to provide EGI with the essential tools to make this happen, a streamlined and standardised middleware distribution that doesn't compromise on security and stability, but opens to emerging, efficient computing and resource management models."*

An NGI's perspective

On 1st May 2010 EGI.eu assumed coordination of grid infrastructures in Europe. From a user's point of view nothing should change – the same tools, applications and services will be available. But what does the change mean for NGIs?

In Slovakia, the Institute of Informatics, Slovak Academy of Sciences, collaborates with five other institutions to establish a grid infrastructure. "We have been a partner in EGEE from day one," says Ladislav Hluchy from the institute. "We've trained users and system administrators during this period and these people will now support the Slovak grid infrastructure during the transition from EGEE to EGI."

The Slovak grid institutions provide dissemination and training for users. They also organise a yearly workshop to discuss how to support new users and new applications, maintain a webpage which provides information on the national grid infrastructure and organise training meetings for users and administrators of the infrastructure. Slovak grid is now working to expand the infrastructure by buying more resources.

"We will participate in the establishment of a pan-European grid infrastructure," says Hluchy. "We will be in touch with a new organisation – EGI.eu in Amsterdam - and we will also be part of the EGI-InSPIRE project. We have been part of EGEE for six years so we will make this transition from EGEE to EGI as smooth as possible, for us and also for our users."



Oxana Smirnova, EMI – *"EGI builds its infrastructure incrementally, starting from the existing grid infrastructures and facilities. Grid specifics are such that middleware is not just an integral part of any infrastructure - it actually defines it. This is why it is vital for EGI to have a reference middleware stack - the Unified Middleware Distribution (UMD) to which EMI will be the key contributor."*



Ludek Matyska, EGI_DS - *"I am very glad to see that the results of the hard work on the EGI Blueprint and related documents, performed within the EGI Design Study EU project, have received such wide support. It inspired creation of NGIs and culminated in the creation of EGI.eu to coordinate future development of grid infrastructure in Europe. The EGI-InSPIRE project, as the first step towards a fully sustainable grid infrastructure, gives an excellent opportunity for Europe to confirm its superiority in grid computing."*



Isabel Campos, CSIC - *"The added value of EGI, when compared to other research infrastructures available in Europe, is its proximity to researchers via the National Grid Initiatives. However, in order to have real impact on the way users approach the European Grid Infrastructure, it is necessary to translate this added value in a scalable model of user support across Europe. The EGI model for user support should rely on the feedback and experience gathered by the NGIs. One of the big challenges of EGI is being able to consolidate the joint experience of all the NGIs involved, and be able to provide a European scale model for supporting international user communities."*



Panos Louridas, GRNET - *"For years now, GRNET has adopted and promoted grid computing in the Greek academic and research community. Since 2006 our scientists have used our grid infrastructure for more than 2.5 million computing hours. This represents a substantial investment, whose sustainability we are eager to pursue. EGI is instrumental in our strategy: it represents for us our commitment in a long term grid infrastructure in Europe, which we will continue to expand and enhance with the collaboration of our partners. GRNET has been involved in the preparations for EGI from the very beginning, and we are very excited about its prospects."*

For more information:

EGI: ***www.egi.eu***

EGI Blueprint: ***http://web.eu-egi.eu/fileadmin/public/EGI_DS_D5_3_V300b.pdf***

EGI_DS: ***www.eu-egi.eu***

EGI Knowledge Base: ***http://knowledge.eu-egi.eu/knowledge/index.php/Main_Page***

EMI: ***www.eu-emi.eu***

IGE: ***www.ige-project.eu***

SIENA: ***www.sienainitiative.eu***

iSGTW: ***www.isgtw.org***

GridTalk : ***www.gridtalk-project.eu***

GridTalk is co-funded by the EC under FP7