



# The European Grid Infrastructure



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## Supporting Large Scale Science in Europe

Scientific research today is no longer conducted within national boundaries – the deluge of scientific data from instruments and computing simulations has led to a shift towards e-Science. Scientists are increasingly dependent on e-Infrastructures for large-scale data analysis.

E-Infrastructures are distributed computing and storage resources, linked by high-performance networks. They now form an integral part of our daily lives as essential tools for scientific research and also for business. To support European science and innovation in the long term, we need a sustainable operational model – to coordinate the infrastructure itself and to deliver integrated services across national borders.

## The EGI-InSPIRE Project

EGI-InSPIRE (European Grid Initiative - Integrated Sustainable Pan-European Infrastructure for Researchers in Europe) is a collaborative effort involving more than 50 institutions in over 40 countries. The associated European Grid Infrastructure (EGI) includes in excess of 300 sites across 50 countries, offering around 240,000 processor cores, and more than 100 petabytes of tape and disk storage. The infrastructure is available to users around the clock achieving a sustained

workload of half a million computer tasks, or jobs, every day. EGI-InSPIRE is coordinating the transition from the previous project-funded system to a sustainable pan-European e-Infrastructure, by supporting 'grids' of high-performance computing (HPC) and high-throughput computing (HTC) resources. EGI-InSPIRE is also ideally placed to join together the new Distributed Computing Infrastructures (DCIs) such as clouds, supercomputing networks and desktop grids, for the benefit of user communities within the European Research Area.

## National Grid Initiatives and EGI.eu

National Grid Initiatives (NGI) have been established to coordinate the development and deployment of local grid infrastructure in nearly every country across Europe. NGIs are coordinated by a new organisation – EGI.eu – which manages the European Grid Infrastructure on behalf of the NGIs, according to the vision outlined in the European Grid Initiative Design Study project and building on the experience of the European Data Grid (EDG) and Enabling Grid for E-Science (EGEE) series of projects. Together, EGI.eu and the NGIs are establishing a permanent and sustainable grid infrastructure. The EGI is initially co-funded by EGI-InSPIRE and, through this project, EGI.eu is working to support interoperability between the NGIs and the existing middleware distributions, such as gLite, UNICORE and ARC.

## Supporting the Users

EGI users are represented by virtual research communities, covering bioinformatics, chemistry, high energy physics, fusion physics, health science and medicine, life science, astrophysics, earth science, earth observation, humanities and computational science.

EGI is an integral part of the World Wide LHC Computing Grid (WLCG) which is used to

analyse the huge amount of data generated by the Large Hadron Collider at CERN, the European Centre for Nuclear Research. It's no mean feat. As the world's largest experiment, built to investigate the building blocks of matter, the LHC will produce an expected 15 petabytes of data per year (that's three million DVDs, or 20,000 years of music in MP3 format).

