e-INFRASTRUCTURE: THE POLICY CONTEXT

The Lisbon Strategy aims to build "the most competitive and dynamic knowledge-based economy in the world" in response to today's economic and social challenges. The European Research Area (ERA) is a key component of the Lisbon Strategy because it boosts research infrastructures, promotes industry investment in European research and contributes to the creation of sustainable growth and jobs.

e-Infrastructure is one of the central pillars of the ERA and supports the i2010 initiative. This is the EU policy framework for the information society and media. It fosters the use of information and communications technology (ICT) for research through:

- building a common European information space: e-Infrastructures know no borders, allow researchers to co-operate, facilitate flow of information across Europe and beyond, and are easily accessible;
- strengthening ICT research and its deployment in Europe: as early adopters of new ICT developments, e-Infrastructures are validating ICT research results and paving the way for further innovation. They are an excellent example of how ICT can be used to make science more effective;
- promoting an inclusive information society: e-Infrastructures make science accessible to all.by facilitating access to scientific discoveries and increasing international co-operation.

e-Infrastructure is rooted in the Capacities objective of the EU's Seventh Research Framework Programme (FP7) and inspired by the policy work carried out in the context of European Strategy Forum on Research Infrastructures (ESFRI), e-Infrastructures Reflection Group (e-IRG) and the ERA.

BUILDING GLOBAL VIRTUAL RESEARCH COMMUNITIES

Practical information:

- http://cordis.europa.eu/fp7/ict/e-infrastructure/home_en.html
- http://ec.europa.eu/dgs/information_society/index_en.htm

KK-81-08-211-EN-D

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European Commission
Information Society and Media

e-INFRASTRUCTURE:

Global Virtual Research Communities

Innovating the scientific **process**

European Commission
Information Society and Media

e-INFRASTRUCTURE IS CHANGING THE WAY SCIENCE IS CARRIED OUT!

WHAT IS E-INFRASTRUCTURE?

- a combination of ICT-based resources and associated tools and services such as networks, computing systems and scientific data repositories
- a new way of collaborating and sharing resources independently of the researcher's geographical location
- a key enabler for virtual global research communities
- a driver for social and economic well-being in Europe

E-INFRASTRUCTURE BY THEME

- Linking ideas at the speed of light: **GÉANT**
- Sharing the best scientific resources: **e-Science grids**
- Accessing knowledge: **scientific data**
- Designing future facilities: **novel e-Infrastructure**
- Innovating in the scientific process: **global virtual research communities**

BUILDING GLOBAL VIRTUAL RESEARCH COMMUNITIES

Are you member of a virtual community?

A virtual community is a group of scattered individuals and/or organisations sharing virtually common interests and resources. Popular examples of such communities are YouTube, eBay and Wikipedia.
Virtual research communities are widely dispersed groups of researchers and associated scientific instruments working together in virtual research environments.
This would be impossible without the underlying e-Infrastructures that help them to produce scientific results at a much lower cost, as effectively as if they were physically in the same place.

Ready to revolutionise science?

Access to large-scale European infrastructures such as the high-speed communication network GÉANT, the massive EGEE (Enabling grids for E-sciencE) grid and repositories of scientific information allows researchers tackling problems of large size and complexity.
This innovative way of doing research is spreading to different fields of science ranging from the immensity of the universe to the detail of human genome.

PROJECTS BRINGING INNOVATION TO THE RESEARCH PROCESS

• *Overcoming complex global challenges*

ITER, an experimental fusion reactor, is one of the largest international research projects aiming to demonstrate the scientific and technical feasibility of fusion power. It will help to make the transition from today's studies of plasma physics to future electricity-producing fusion power plants.

The EUFORIA project (EU Fusion fOR Iter Applications) provides an advanced grid and supercomputer infrastructure for scientific computing to the nuclear fusion modelling and simulation community. It is vital for implementing the ITER project.

• *Bringing together world's researchers*

The D4Science project is consolidating and expanding the e Infrastructure for two scientific communities: environmental monitoring and fishery resources management. The project provides a joint virtual research environment based on shared computation, storage and generic service resources offered by EGEE. Satellite, climate, hydrographical and a large variety of other types of data is offered by large international organisations to support the development of applications.

"The D4Science project provides Virtual Research Environment offering a collaborative instrument for thousands of researchers across the world to efficiently address critical global issues."
Donatella Castelli, ISTI-CNT (Italy), coordinator of the D4Science project

• *Addressing Societal challenges*

By developing a new user-friendly Grid-based research e-Infrastructure, the neuGrid project will enable the European neuroscience community to carry out research required for the pressing study of degenerative brain diseases. In neuGrid, the collection/archiving of large amounts of imaging data will be paired with computationally intensive data analyses.
"Thanks to neuGrid, neuroscientists will be able to identify neurodegenerative disease markers through the analysis of 3D magnetic resonance brain images via the provision of sets of distributed medical and Grid services.", Giovanni B. Frisoni – Fatebenefratelli (Italy) and neuGrid coordinator.

• *Pioneer communities*

DIESIS - basis for a European modelling and simulation e-Infrastructure to foster research on critical infrastructure
DORII - remote instrumentation e-Infrastructure for the earthquake, environmental science and experimental science communities
DRIVER-II - cohesive, multidisciplinary pan-European infrastructure of digital repositories
EDGeS - the European Service grid infrastructure (EGEE) interconnection to the desktop grids
e-NMR - platform integrating and streamlining computational approaches for nuclear magnetic resonance analysis
ETSF - state-of-the-art computer simulation tools for electronic excited states in matter
EUROVO-AIDA - seamless access to heterogeneous, distributed and generally freely accessible data
EVALSO - strategic European astronomical observatories connection in Chile
FEDERICA - virtual capability on top of GÉANT for testing and deploying new internet architectures
GENESI-DR - access to Earth science digital repositories
IMPACT - computer technology serving biological researches on protein

METAFOR - identification, access and use of climate data
NMDB - European digital repository for cosmic ray data
GLOBAL provides a large-scale multi-site video conferencing service to the e-Infrastructure community around the globe

Support

BELIEF-II coordinates effective knowledge flow between e-Infrastructure projects and their users. Its Digital Library holds various data of e-Infrastructures projects.