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

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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**

Is it possible to make science of the future with tools of the past?
Many European research communities have changed their working patterns following the dramatic growth in the available processing power, memory and data transmission capabilities. For conducting pioneering research and innovation, scientists nowadays need computing power of the highest quality. Supercomputers, simulations and advanced modelling of complex systems have become essential tools for many scientific communities such as climate research, earth science, nanotechnology, computational chemistry, high-energy physics and biology and are shaping the future directions of research and engineering.

Is Europe ready for this revolution in science?
Without an eco-system of research infrastructures that reflects the ever-growing needs of scientists for computational facilities, Europe faces the risk of losing its international leadership in science. The priority list of new research infrastructures identified by the European Strategy Forum on Research Infrastructures (ESFRI) clearly highlights the importance of an advanced European high performance computing service and the urgency of building a new family of peta-scale supercomputers in Europe.

Can Europe compete with countries like the U.S. or Japan in the construction of this advanced ecosystem of supercomputers?
Yes. Europe is committed to further develop the European high performance computing service, responding both to the capability (high performance) and capacity (high throughput) computing needs of scientists. By combining the efforts of EU Member States, the support of the European Union and the "savoir faire" of the European industrial and academic communities, novel e-Infrastructure in the computing domain will emerge, offering the European research community unprecedented network, processing and storage capacity at a pan-European level to stay at the forefront of scientific advances.

In future, giant leaps in knowledge will only be possible with the help of complex simulations done in ecosystems of extremely powerful high performance computers.

PRACE (Partnership for Advanced Computing in Europe) aims to build a family of peta-scale supercomputers in Europe. The current preparatory phase addresses the technical, strategic, financial, legal and organisational requirements for the construction. It involves 16 European countries at present.

Projects related to the establishment of an eco-system of computational resources in Europe:

EGEE (Enabling grids for E-sciencE) connects in a coordinated way the clusters of computers of 240 institutions in 45 countries around the globe into the world's largest multi-science grid infrastructure.
In 2008, more than 60.000 processors belong to this grid that successfully completed more than 100.000 jobs per day.

DEISA (Distributed European Infrastructure for Supercomputing Applications) pulls together the power of the eleven largest supercomputers in Europe, providing virtual access to these large high-performance computing facilities to solve scientific problems of huge complexity.

In 2008, 45 scientific projects are involved with a total allocation of around 30 million processor-core hours.

EGI-DS (the Design Study for a European grid Infrastructure - EGI) provides the conceptual setup and operation of a new organisational model of a sustainable pan-European grid infrastructure.
Europe is aiming to establish a sustainable European grid infrastructure (EGI). Many countries have launched or are in the process of launching National grid Initiatives (NGIs). EGI aims to coordinate the integration and inter-operation of such NGIs.

Information and communication infrastructures are pervasive in today's society and must be highly reliable. The DIESIS project is a design study for an interoperable European federated simulation network that can be used as a tool for assessing critical infrastructures. It aims to develop communication protocols to support the design of robust IT-based architectures for such infrastructures.

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