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

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e-infrastructure

European Commission
Information Society and Media

e-INFRASTRUCTURE:

Scientific Data

Accessing **Knowledge**

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**

THE DATA CHALLENGE

Do you expect to see smoking tubes and coloured solutions in a modern biological laboratory?

No, not nowadays! Research is carried out differently today. For example, the Sanger Institute, which is a genome-sequencing centre located near Cambridge, UK, hosts large rooms filled with computer-controlled DNA-sequencing machines and racks of high-powered servers and arrays of storage disks.

Scientific data have come to the forefront of modern science; it is the new way to express knowledge. Many disciplines are developing into highly data-intensive areas of science such as high-energy physics, astronomy, bio-informatics, genomics and medical imaging.

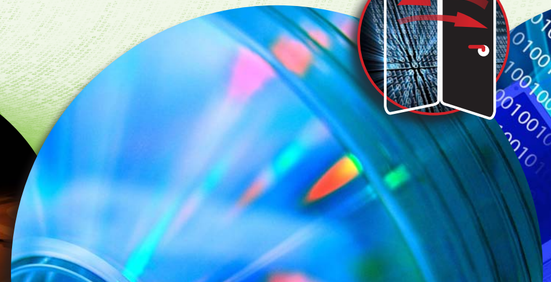
What is so challenging about scientific data?

Scientific experiments, observations, theories, models and simulations generate unprecedented volumes of data which will quickly reach the exabyte scale It is stored in complex databases consisting of numbers, text, images, diagrams and formulas.

Just to give an idea, the GÉANT network, reaching speed of terabit/s in 2020 would still take 93 days to transmit an exabyte data file…

Who will be able to navigate in this immense see of information? These enormous quantities of digitally born material need to be properly collected, archived, stored, curated, managed and accessed to be useful.

European funded projects in the domain of **Scientific Data infrastructures** share a common vision that any form of scientific content resource, including scientific reports, research articles, experimental or observational data, rich media etc, should be easily accessible through user friendly e-Infrastructures services.



What do digital repositories do?

Digital repositories have become a strategic infrastructure to support research as they

- provide new, integrated sources of information in an accessible way to scientists and students;
- enable scientists to use information from a multitude of data sources around the world in order to obtain better scientific results;
- take several key aspects into consideration such as availability, permanency, quality, right of use and interoperability.

PIONEERING SOLUTIONS

Multi-disciplinary European scientific repositories

DRIVER II *(e-Infrastructures and info-structures)* - delivers a pan-European infrastructure federating scientific repositories. It uses open standards and supports complex information objects. Digital repositories will make both published and experimental data widely available for use and thus support new paradigms for research.

Policy reflection

PARSE.Insight aims to help define the infrastructure needed to preserve and use the digitally encoded information on which our society increasingly depends and which future generations will inherit.

Scientific communities building digital repositories

EURO-VO-AIDA *(astronomy)*: moving the astronomical European Virtual Observatory into a fully functioning operational phase

GENESI-DR *(Earth observation)*: open and seamless access to Earth science repositories (space, airborne and in-situ sensors data)

IMPACT *(bio-informatics)*: improving protein annotation through coordination and integration of databases

METAFOR *(climatology)*: common information model and tools for using climate data and models

NMDB *(space physics)*: digital repository for cosmic ray data, pooling archives and collecting observations real-time

PESI *(biodiversity)*: taxonomically validated standardised nomenclatures for biological and biodiversity management

Support

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

IMPROVED ACCESS TO RESEARCH RESULTS

e-Infrastructures have the potential to improve access to latest knowledge in strategic areas, crucial for the European research competitiveness.

e-Infrastructures provide new possibilities of knowledge dissemination and support the implementation of the new open access paradigm, defined as free access to scientific information over Internet.

A key objective of the open access pilot, launched by the European Commission in August 2008, is to ensure fast and reliable access to EU-funded research results, in order to drive innovation, advance scientific discovery and support the development of a strong knowledge-based economy. The unrestricted online access to EU-funded research results, based on the usage of common digital repositories (open archives), will guarantee better exploitation of results, maximum return on European investment in research and development as well as reduced waste of time and public resources in duplicative effort.

The open access pilot, to run until the end of FP7, is an important step towards achieving the "fifth freedom", the free movement of knowledge amongst Member States, researchers, industry and the public at large.