

E-SCIENCE IN POLAND

current state and perspectives for the future

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A key task for Poland is to join the process of building the information era by employing modern information and communication technologies, creating conditions for direct access to information, raising the society's awareness and developing its intellectual and economic potential. Given the process of integration with European Union structures, the need to adapt Polish solutions and standards to the emerging modern information society has arisen.

The infrastructure for the information society

From 1993 to 2000 the following networks were built to serve the academic society:

- 21 fibre-based academic Metropolitan Area Networks (MAN)
- 5 high Performance Computing Centres
 - TASK - Academic Computer Centre in Gdansk
 - Cyfronet - Academic Computer Centre AGH in Krakow
 - ICM - Interdisciplinary Centre for Mathematical and Computational Modelling in Warszawa
 - PCSS - Poznan Supercomputing and Networking Centre
 - WCSS - Wroclaw Centre for Networking and Supercomputing
- 2 wide-area networks:
 - The Research and Academic Computer Network (Naukowa i Akademicka Siec Komputerowa - NASK)
 - POL-34, with an international link providing a 155 Mb/s capacity (POL-34 to the TEN-155 network and the NASK to Stockholm)

Their construction was financed from the program of the State Committee for Scientific Research (Komitet Badan Naukowych - KBN).

"PIONIER: Polish Optical Internet - Advanced Applications, Services and Technologies for the Information Society"

The Polish scientific community has been developing the information infrastructure for science according to the program of the State Committee for Scientific Research entitled "PIONIER: Polish Optical Internet - Advanced Applications, Services and Technologies for the Information Society". It was launched in 2000 for the years 2001-2005, and followed by PIONIER 2 for the years 2006-2009. The PIONIER program was significant for the program "ePoland - The Strategy on the Development of the Information Society in Poland for the years 2004-2006". The ePoland was inspired by the program "eEurope 2002 - An Information Society for All", a European initiative, the goal of which is to accelerate actions aimed at transforming the European society into a global Information Society.

Selected examples of projects based on the resources of the PIONIER network:

E-SCIENCE - stands for research enforced by distributed global cooperation, heavily depending on the availability of robust networking infrastructure, the access to large datasets of distributed systems and remote visualisation. The projects related to e-Science aim at the development and integration of grid computing applications tools for creation of remote research environments and the specialised research equipment

- PROGRESS - creation of an environment providing access to computational applications, which run in a real distributed cluster composed of several SUN computers
- SGLgrid - providing virtual laboratory allowing the large scale computations and visualizations performed on clusters of SGI computers
- The Virtual Laboratory - a heterogeneous distributed environment, which allows a group of scientists from different sites to work on one project. Two laboratory profiles are implemented now:
 - Virtual Laboratory of NMR Spectroscopy
 - Virtual Laboratory of Radio Astronomy

E-LEARNING - supports integration between new technologies and applications, creating multimedia information centres and educational content databases

- The Interkl@sa Programme - a country wide co-operation network of thousands of schools, teachers, pupils, educational NGO's working together to bring Polish education closer to the European Union standards

The construction of modern research infrastructures has created conditions for better cooperation of different academic societies. This cooperation has allowed to participate in many international research projects, co-funded from the 5th and 6th Framework Program of the European Union. The PIONIER program has triggered many supporting activities, such as e-Polska, Wrota Polski, etc., aiming at building the base mechanisms for information society and providing Poland equal partnership opportunities to other countries. The program is focused on three areas:

- construction of broadband network infrastructure supporting the science, matching similar installations in other European countries
- development and verification of pilot services and applications for information society, creating a base for new developments in: science, education, health care, natural environment, government and local administration, industry and services
- creation of competitive conditions for active software development for new applications in information society

The main priority of the PIONIER Program is to build optical network of new generation - the PIONIER network. The network topology includes over 6000 km of its own optical fibres and will connect 21 optical academic metropolitan area networks. The DWDM technology, up to 32 lambdas, is used starting with 10 Gb/s Ethernet. The PIONIER Network has optical international links to research and education networks in such neighbouring countries as Germany, the Czech Republic, Slovakia, Ukraine, Belarus, Lithuania and Russia. For the benefits of the European co-operation it provides international connectivity to the pan-European network GÉANT through 10 Gb/s Ethernet and 10 Gb/s Packet over Sonet direct connections between the PIONIER Network and GÉANT PoP in Poznan. Moreover, two 2.5 Gb/s links provide general Internet access for the whole academic community in Poland.

PIONIER network can be used by:

- universities, research units, educational institutions
- government and local government units
- cultural institutions
- libraries
- public health services
- public utility institutions
- other institutions financed by the state budget



E-CONTENT - empowering the creation of the digital content in the area of culture, world heritage, electronic publishing and audio-visual sector

- dLibra - first Polish digital library environment, used by institutions such as academic and public libraries to make stored digital publications available on the Internet. These institutions create Polish platform of distributed digital libraries based on the PIONIER network and dLibra software.

dLibra
first Polish digital library environment

REGIONAL DIGITAL LIBRARIES

- Digital Library of Wroclaw
new October 2002
http://www.wroclaw.pl
- Bohemian Digital Library (new Wrocław University of Technology PL)
new November 2002
http://www.wroclaw.pl
- Kujawsko-Pomorskie Digital Library
new September 2002
http://www.kujawsko-pomorskie.pl
- Zachodniopomorskie Digital Library
new October 2002
http://www.zp.gov.pl
- Mazowieckie Digital Library
new October 2002
http://www.mazowieckie.pl
- Lubuskie Digital Library
new November 2002
http://www.lubuskie.pl
- Wielkopolskie Digital Library
new October 2002
http://www.wielkopolskie.pl
- Śląskie Digital Library
new August 2004
http://www.slaskie.pl

INSTITUTIONAL DIGITAL LIBRARIES

- National Digital Library "Polonia"
new October 2002
http://www.onet.pl
- Wrocław University Digital Library
new November 2002
http://www.wroclaw.pl
- Pedagogical Digital Library
new May 2004
http://www.op.jkdn.pl
- Digital Library of the National Institute for Teacher Training Center (ONK) Warszawa
new May 2004
http://www.onk.pl
- Wrocław University of Technology Digital Library
new May 2004
http://www.wroclaw.pl
- Lodz University of Technology Digital Library
new November 2002
http://www.lodz.pl
- Digital Library of the Federation of the Church Libraries PISE
new August 2004
http://www.pise.org.pl

- Interactive TV (iTV) - in 2002 started the realisation of the project entitled "System of audio-visual signal provision in Polish Optical Internet". Its objective is to realise inter-active television. It is a joint project of research community and Polish TV, aiming at delivery of personalised, high quality streaming multimedia content to large number of users

SUMMARY:

The perspectives for E-science in Poland

"The Polish National Development Plan 2007-2013" includes "The Trend Strategy on the Informatization Development of Poland till 2013 and the Forecast for the Transformation of Information Society till 2020"

- development of the informatics infrastructure for science
- general education for the information society
- development of Polish digital resources and services available on the Internet (especially libraries' and museums' virtual collections and e-learning)
- the establishment of virtual scientific organizations
- escalation of the availability of Polish digital resources in multilingual versions

The potential of academic libraries

- experience focused on information science
- evaluation of relevance of information
- recognition of users' needs
- access to professional digital resources
- collection of data
- technical support (informatics systems, computer networks, Internet access)
- creation of subject gateways, web-portals and databases