Project Achievements

100 Gbit/s Carrier-Grade Ethernet Transport Technologies

The 100GET consortium addressed new networking concepts and physical layer technologies for next generation Ethernet based transport networks (beyond 10GbE). 100GET was a cluster project consisting of five sub-projects investigating mainly different approaches and a number of horizontal activities providing technologies, components and a 100 Gbit/s testbed for Layer-1 to Layer-3 testing. Project management and common activities, like working committees for technical exchange, were organized in the framework of 100GET.

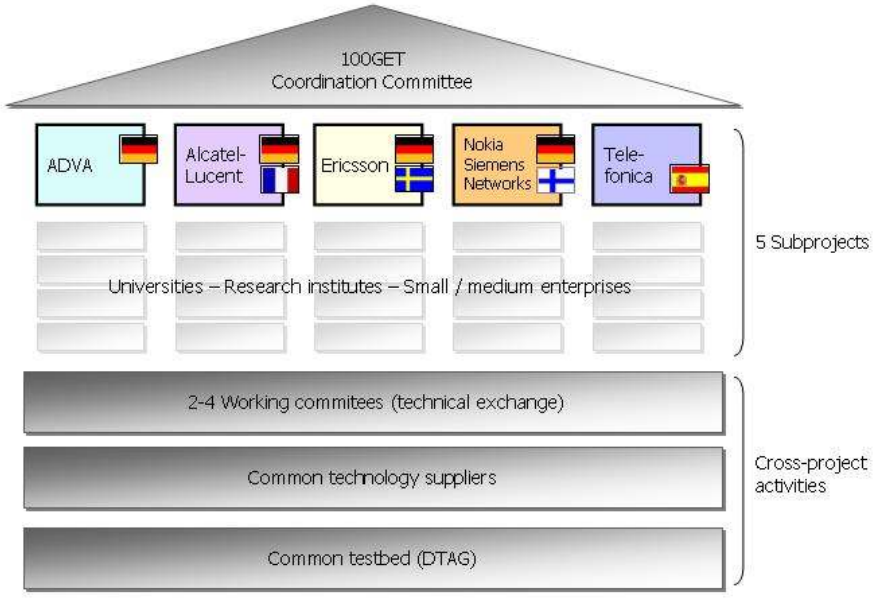
Main focus

During recent years a growing trend towards IP/Ethernet transport technologies can be observed for local area, access, metro and core networks, and it is a common understanding that Ethernet will be the dominant transport technology of next generation metro/core networks. The expected strong growth of traffic in data networks combined with high pressure on transport costs will lead to a strong demand for the next generation of Ethernet technology. 40 and 100 Gigabit Ethernet (40/100GbE) have been expected to be the next logical evolution steps after 10GbE and in fact meanwhile have been standardized in IEEE 802.3ba and ITU-T SG15. Moreover, this major technological step had to be done in line with the evolution of a flexible broadband next generation metro/backbone network including the convergence of Ethernet with optical transport technologies (OTH/OTN/WDM). The 100GET project addressed new networking concepts and physical layer technologies for next generation Ethernet-based transport networks (beyond 10GbE) with carrier-grade performance.

Approach

The **network part** aimed at convergent networks based on a multi-layer, multiservice architecture with advanced 100 Gbit/s technologies and novel Layer 2 packet transport techniques offering:

- Carrier-grade performance in order to fulfil reliability, availability, quality of ser-



100GET

Project ID: CP4-001

Start Date: 1 October 2007

Closure date: 31 December 2010

Partners in the horizontal activities:

Atesio GmbH, Germany

Deutsche Telekom, Germany

JDSU Deutschland GmbH, Germany

Konrad Zuse Zentrum für Informationstechnik (ZIB), Germany

Co-ordinators:

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Project Website

www.celticplus.eu/projects/celtic-proojects/call4/100GET/Project-default.asp

vice, and supervision requirements of the future services and broadband applications

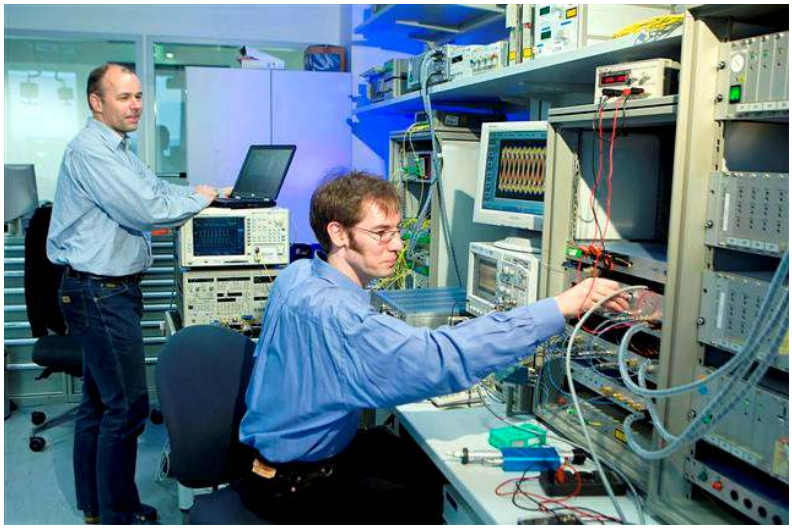
- Scalable network solutions with node capacities in the multiterabit/s range to match the rapidly growing network traffic introduced by new services
- Integrated control of network elements based on GMPLS control plane functions and the Multiprotocol Label Switching Transport Profile (MPLS-TP)).

The **physical layer part** investigated promising technology options for low-cost 100GbE transponders offering a high integration level, low power consumption and promising cost/performance tradeoffs. The most promising concepts have been designed and realised for integration into advanced 100 Gbit/s Tx/Rx prototypes. The subsystem prototypes were integrated into a 100G system demonstrator and analysed in 100 Gbit/s per channel transmission system tests in order to identify the most powerful technology options for next generation 100 Gigabit Ethernet based transport systems.

The **horizontal activities** provided to the other project parts methods and tools for optimization of 100 Gbit/s based network architectures as well as optical measurement and assessment technologies. Furthermore, the requirements for 100 Gbit/s based networks have been defined, common reference scenarios and a field test environment were provided including network aspects, such as interworking of the different solutions, network control and optimization. Deutsche Telekom provided a common testbed, which offered tests under field conditions for the developed layer 1 transmission, layer 2 Ethernet, and layer 3 control plane functional and technological solutions. Last but not least common approaches to standardization bodies have been defined.

Achieved results

The main technical results are described in the leaflets of the five subprojects. The horizontal activities complemented these results by validation of the technical solutions in the common testbed, by verification of design and measurement technologies under realistic conditions, by preparation of a white paper and dissemination activities as well as by inputs to standardization.



Impact

The growth of demand for broadband services leads to large growth rates of transmission capacity in optical transport metro and core networks. The new optical technologies developed in this project will enable operators to cope with these requirements in a cost efficient way, assure the competiveness of system vendors, and will allow citizens and companies to participate in the future information society in high quality.

The collaboration of major European telecom operators, system vendors, SMEs, research institutions, and university labs led to the accomplishment of a common vision –compiled in a white paper -, allowed a better integration and interworking of the European optical networks, and strengthened the European industry's position in 100 Gbit/s carrier-grade Ethernet technologies.

Sub-project Leaders:

100GET-AL: Alcatel-Lucent Deutschland AG, Germany

100GET-METRO: ADVA AG Optical Networking, Germany

100GET-E3: Nokia Siemens Networks GmbH & Co. KG, Germany

100GET-ER: Ericsson GmbH, Germany

100GET-ES: Telefónica, Spain

About Celtic

Celtic is a European research and development programme, designed to strengthen Europe's competitiveness in telecommunications through short and medium term collaborative R&D projects. Celtic is currently the only European R&D programme fully dedicated to end-to-end telecommunication solutions.

Timeframe: 8 years, from 2004 to 2011

Clusterbudget: in the range of 1 billion euro, shared between governments and private participants

Participants: small, medium and large companies from telecommunications industry, universities, research institutes, and local authorities from all 35 Eureka countries.

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