

STRONGEST - Scalable, Tunable and Resilient Optical Networks Guaranteeing Extremely-high Speed Transport

STRONGEST is an Integrated Project in the EC's 7th Framework Programme having as the first goal the design and demonstration of an evolutionary ultra-high capacity multilayer transport network, based on optimized integration of Optical and Packet nodes, and equipped with a multi-domain, multi-technology control plane.

At a Glance: STRONGEST

Scalable, Tunable and Resilient Optical Networks Guaranteeing Extremely-high Speed Transport

Project Coordinator

Andrea DI GIGLIO

Telecom Italia S.p.A.

Tel: +39 011 2287533

Fax: +39 06 41863906

Email: andrea.digiglio@telecomitalia.it

Project website: www.ict-strongest.eu

Partners: Telecom Italia (IT), Alcatel-Lucent Deutschland (D), British Telecom (UK), CTTC (ES), CNIT (IT), Deutsche Telekom (D), Ericsson (IT), IBBT (BEL), Nokia Siemens Networks & Co. GmbH (D), Telefonica (ES), Universitaet Stuttgart (D), Universitat Politècnica de Catalunya (ES), University of Essex (UK), University of Peloponnese (GR), VECOMM (IT), PrimeTel PLC (CY), Nokia Siemens Networks Israel, (IS)

Duration: 01/2010 – 12/2012

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Total Cost: € 12.636.126

EC Contribution: € 7.386.016

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Main Objectives

STRONGEST's main goal is to design and demonstrate an evolutionary ultra-high capacity multilayer transport network, based on optimized integration of Optical and Packet nodes, and equipped with a multi-domain, multi-technology control plane, overcoming the problems of current networks that still provide limited scalability, are not cost-effective and do not properly guarantee end-to-end quality of service.

STRONGEST is an industry led project; the consortium brings together major European industrial players, leading Telecom operators, Universities and Research Centres and as such, it enables the necessary synergies and creates an ideal environment for innovation and development.

The European scale of the project is made necessary by the development of a new reality in which countries and federations are immensely and inextricably linked. To have a common view at European level is essential to apply the project's outcomes.

A major impact from STRONGEST will be to strengthen the position of European industry in the field of Future Internet and to reinforce European leadership in optical networks technologies. The design of a more efficient transport network with reduced cost per bit and the particular attention to energy efficiency will turn into benefit to the entire Community.

Network Operators have a tough target to reduce CO₂ emissions, whilst at the same time supporting significantly higher information bandwidth. They will use the results of STRONGEST, which will provide the optimum transport network architecture to achieve these targets. STRONGEST results will be exploited by **Vendors** to develop traffic engineering solutions running in multi-technologies and multi-domain context, and the related control plane in both legacy nodes and new optical/packet nodes. **Academic Partners'** plan to use the STRONGEST results for further enhancement of knowledge transfer, training and skills creation in the field of telecommunication networks, more specifically in the field of optical networks.

STRONGEST's main goal is to design and demonstrate an evolutionary transport network, ensuring higher scalability, cost effectiveness and better end-to-end quality of service.

Work breakdown

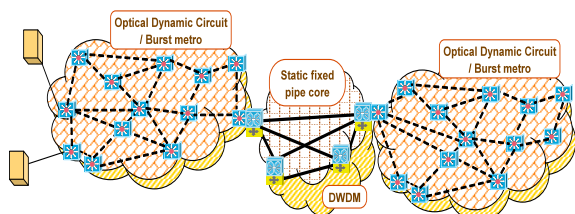
STRONGEST scientific and technical activities of the project are organised into 4 main Work Packages:

- WP2 “Network efficiency and optimization”; its main goal is to design efficient and optimized network architectures for new transport solutions.
- WP3 “End-to-end solutions for efficient networks”; its main goal is to provide efficient solutions to support end-to-end services delivery across domains that are heterogeneous in terms of technologies.
- WP4 “Network prototypes implementation and demonstration”; its main goal is the implementation, integration and experimental validation of the developed solutions.
- WP5 “Technical coordination, dissemination and standardization”, for guaranteeing strong coordination of all the technical activities in the project, including dissemination and standardization

Finally, all the activities related to the management of the project are included in WP1 “Project Management”

Key Issues

- To analyse the feasibility of the proposed architectures by means of performance and techno-economic impact studies, aiming at network performance and cost optimization.
- To identify the best solutions to reduce the energy consumption of the telecommunication network. Efficient combinations of optical and electrical components will be investigated.
- To research, develop, analyze and experimentally validate the optimum combination of L1 (Optical) and L2 (Packet Transport, OBS,...) transport technologies.



- To pursue end-to-end services delivery crossing domains that are heterogeneous in terms of technologies (circuit transport networks and connection-oriented packet transport networks), control plane models (e.g. multi-layer/multi-region), OAM mechanisms, vendors and operators.

- To enable the virtualisation of resources, allowing the cooperation among heterogeneous data-plane technologies; this will permit quick and low-cost introduction of new services independent of the underlying transport platform.
- To experimentally validate the investigated network architectures, forwarding concepts and control mechanisms in an experimental implementation; therefore, quantitative technical laboratory investigations will be carried out.
- To contribute to the development of new European and global interoperable standards for multi-layer and multi-domain data and control plane, thus reinforcing the European position in standardization bodies and fora. The proposed new control and management mechanisms will be presented to the relevant working groups in IETF, IEEE802, OIF and ITU-T, ETSI standardization organizations.
- To foster the scientific exchange and collaboration between other scientific projects and organizations such as IST FEDERICA, BONE, AKARI (Japanese research Project) and GENI (American research Program).
- To educate European key staff including research managers and industrial executives.

Expected Impact

STRONGEST will contribute towards the transformation of communication network infrastructures and will support the knowledge based economy by setting the foundations of novel network architectures. In more detail:

- Strengthening the position of European industry in the field of Future Internet technologies and reinforce European leadership in optical networks technologies.
- Increasing the economic efficiency of access/transport infrastructures (cost/bit).
- Facilitating the creation of Global standards, interoperability and European IPRs reflecting federated and consistent roadmaps.
- Creating wider market opportunities from new classes of applications.
- Accelerating the uptake of the next generation of networks and service infrastructures.