Project Information

100GET-E3

100GET End-to-End Carrier-Grade Ethernet

100GET-E3 investigates future packet transport in core networks at lower cost (TCO) than IP/MPLS and SDH, based on Carrier Ethernet and DWDM technologies.

Main focus

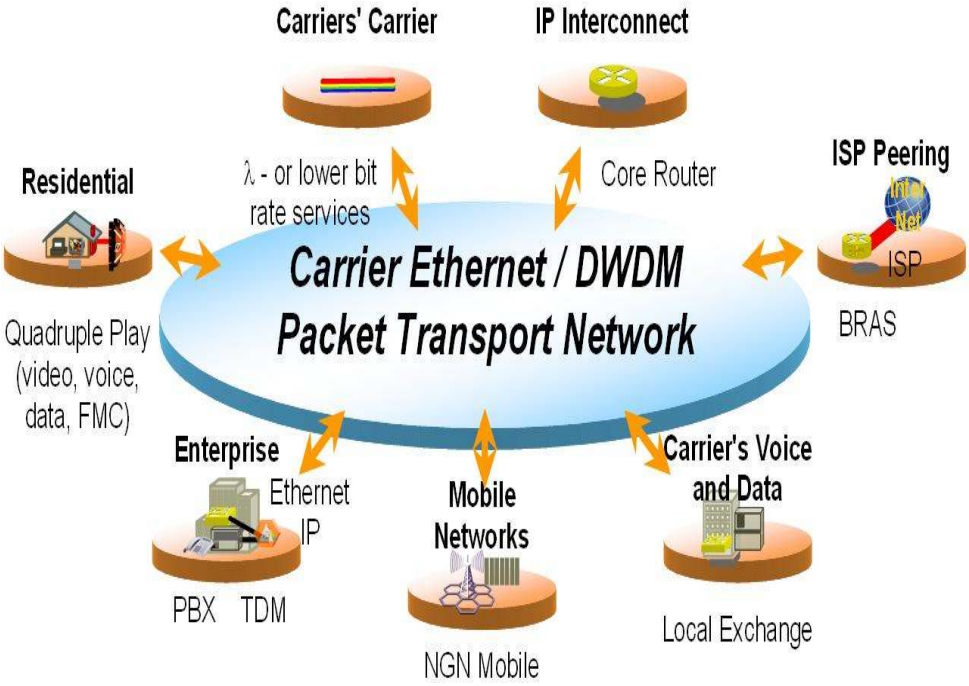
100GET-E3 addresses both the lack of "Carrier Grade" features in IP/MPLS - e.g. missing end-to-end quality of service (QoS) - and the network operators' dilemma of exponential traffic growth at flat revenue. To this end, the project integrates investigations on both physical layer and networking aspects:

- Robust and spectrally efficient optical 100Gb/s transmission
- Minimized connection cost across technology layers, using efficient grooming and aggregation of packet traffic as well as supremely cost-effective optical switching of aggregated traffic
- Automated management & control-plane based provisioning across technology layers and network domains

Approach

To adequately address the exceptional diversity of scientific issues in 100GET-E3, a close collaboration between Nokia Siemens Networks as industrial project leader and a group of outstanding partners from German industry, research and academia was formed in later 2007. A group of distinguished Finnish partners is about to complement these activities starting mid 2008.

On the physical side, coping with divergence between traffic volumes and revenues requires capacity enhancement of legacy fibre infrastructure. To this end, a range of novel modulation formats - with preference on polarisation-multiplexed QPSK with coherent detection - is assessed in terms of performance, complexity,



100GET-E3

Project ID: CP4-001

Start Date: 1 October 2007

Closure date: 30 September 2010

Partners:

CoreOptics, Germany

Helsinki University of Technology, Finland

IHP GmbH, Germany

Nethawk Oy, Finland

Nokia Siemens Networks, Finland

Nokia Siemens Networks, Germany

Technical University Braunschweig, Germany

Technische Universität Dresden, Germany Technical University München, Germany

Tellabs Oy, Finland

Universität Würzburg, Germany

VTT (Technical Research Center of Finland), Finland

Co-ordinator:

Thomas Michaelis

Nokia Siemens Networks, Germany

E-mail: thomas.michaelis@nsn.com

Project Website

www.celtic-initiative.org/projects/100GET

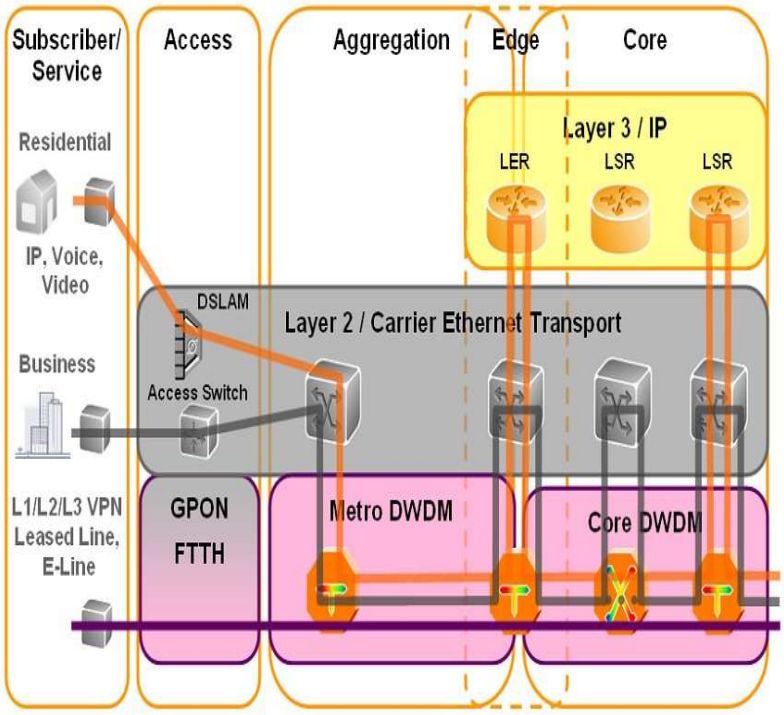
feasibility, and cost, respectively.

On the networking side, the added complexity of Carrier Ethernet and DWDM technologies may raise questions regarding many multi-layer and multi-domain issues in the first place. Appropriate solutions in such a layered archi-tecture for routing / traffic enginee-ring, resilience, planning, manage-ment and control/ provisioning, however, yields significant poten-tial for reduction of capital and operating expenditures.

Main results

- Multi-layer network architecture - Requirements and functional specification of the Carrier Ethernet / DWDM target network architecture, i.e. which functionalities need to be located where in the network on which technology layer(s), and how do they interact.
- Multi-layer routing / grooming framework - Well-balanced combination of routing algo-rithms, resilience mechanisms and admission control for the involved technology layers as basis for planning and provis-ioning.
- Multi-layer and multi-domain provisioning framework - Requirements and functional specification for policy-based QoS provisioning, with required signalling and/or routing protocol extensions.
- Multi-layer network management - Requirements and functional specification of the NMS functional remainder in presence of a distributed control plane, featuring an integrated network view across technology layers.
- 100Gb/s-scalable packet processing - Feasibility assess-ment and proof-of-concept FPGA demonstrator for a 100Gb/s-scalable NPU architecture.
- 100Gb/s DWDM transmission - A set of robust and spectrally efficient modulation formats, assessed and understood in terms of performance, complexity, feasibility, and cost.

Impact



Project results will pave the way for packet transport in core networks based on Carrier Ethernet and DWDM technologies, as the cost structure of IP/MPLS is considered too expensive for coping with the predicted traffic growth. The involved industrial parties leverage their excellent footprint in circuit-switched transport, extending it to future packet transport.

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.

Celtic Office

c/o Eurescom, Wieblinger Weg 19/4,

69123 Heidelberg, Germany

Phone: +49 6221 989 405, e-mail: office@celtic-initiative.org

www.celtic-initiative.org

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