Project Information

Together IP, GMPLS and Ethernet Reconsidered, phase 2

TIGER2 aims at consolidating, both theoretically and experimentally, network architectures that rely on a combined deployment of IP/Ethernet (packet) and optical (transport) technologies in an integrated multi-domain and multi-layer context, leveraging and extending current and ongoing standards. TIGER2 addresses issues on both the data and control planes and completing their capabilities by employing a knowledge plane. Beyond the pure technological aspects, the transformation of metropolitan networks impacts simultaneously the access and core networks segments, triggering new research challenges for TIGER2.

Main focus

Carrier Ethernet technologies are progressively re-shaping the landscape of the metropolitan networks. This affects the access and core segments and raises expectations on self-regulating and self-maintaining networks. TIGER2 aims to provide a solution to the issues raised by the interworking of multiple technologies such as DWDM, Ethernet, IP and GMPLS.

TIGER2 focuses on both access and aggregation networks, as well as core transport segments, under the common notion of technology integration: IP/Ethernet/DWDM. TIGER2 relies on the key concepts of automation (by extensive use of advanced and unified control plane deployments targeting multi-layer and multi-region networks, along with the introduction of selected Autonomic Networking concepts and self-* features), and cost (CAPEX/OPEX) reduction.

The main results are disseminated by pushing propositions in standards, bringing awareness on the TIGER2 solutions to operators by workshop events, organizing demo events that show-case TIGER2 outcomes and involving in joint events with other European R&D projects.

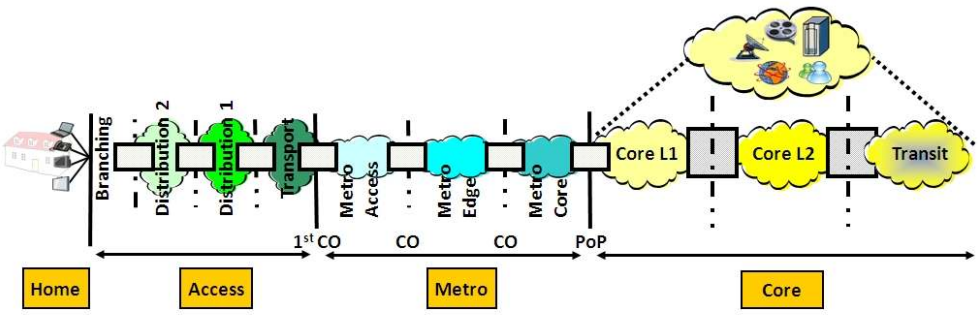
Approach

The project has a dual (theoretical and experimental) approach, combining the proposition of new architectures and paradigms along with the demonstration of concrete feasibility studies. The project identifies shortcomings in existing standards and industry best practices, proposes potential solutions to overcome these limitations, and validate them by means of simulation and experimentation.

Main results

The WP2 on “Metro/access and Content-optimized architectures” provides guidelines for design/engineering of the next-generation backhauling and aggregation networks:

- Simplified, Unified, De-segmented, De-Layered access and metro infrastructures
- Using packet-based data plane
- Optimized for resilient content and video distribution including multipoint connectivity



TIGER2

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Partners:

AITIA International Inc., Hungary

Alcatel-Lucent Bell Labs France, France

Budapest University of Technology and Economics, Hungary

Centre Tecnològic de Telecomunicacions de Catalunya, Spain

France Telecom Orange Labs, France

GRN Serveis Telemàtics, S.L., Spain

Intercom Telemática Girona, S.L., Spain

Marben Products, France

RAD Data Communications, Israel

Telecom ParisTech, France

Telefónica I+D, Spain

Universitat de Girona, Spain

Co-ordinator:

Laurent Ciavaglia

Alcatel-Lucent, France

E-mail:
Laurent.ciavaglia@alcatel-lucent.com

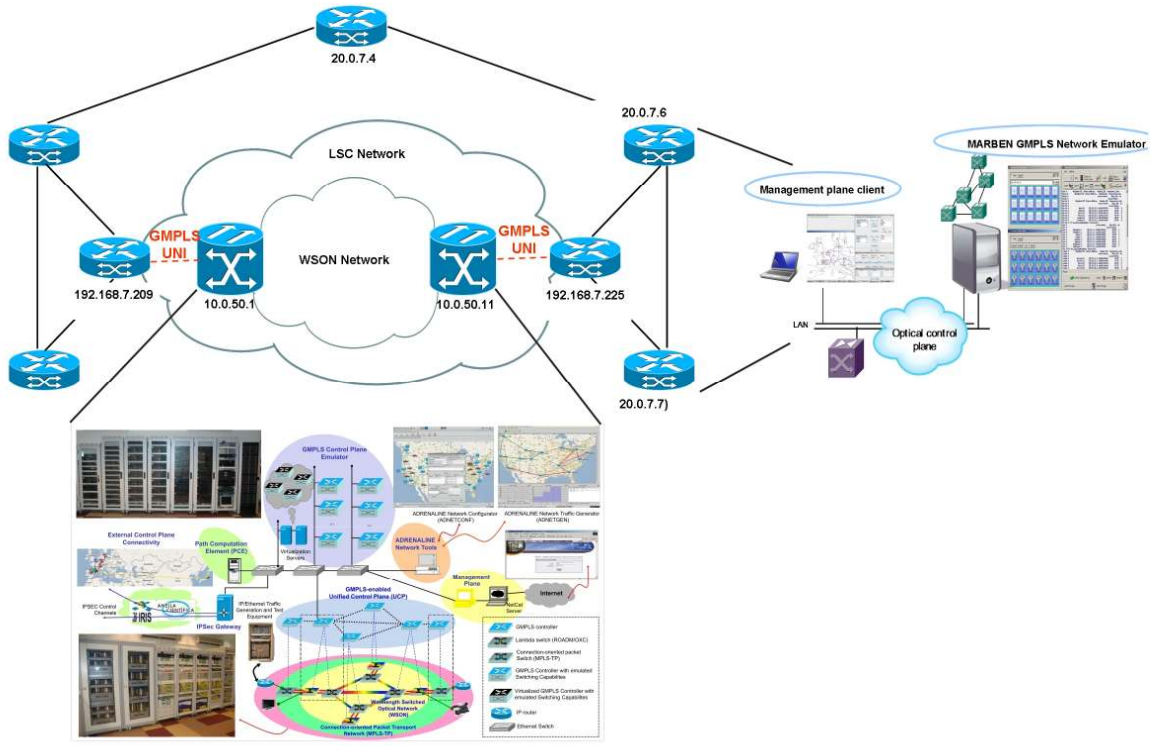
Project Website

www.celtic-initiative.org/projects/TIGER-II

The WP3 on “Metro/core architectures and Interworking” provides functional and protocol architectures for a better integration of PSN/Ethernet on optical technologies (such as Wavelength Switched Optical Networks, WSON) in single and multi-domain core/transport networks, along with an in-depth analysis of the relevance/gains of introducing a layer-2 switching layer between the IP and WDM “layers”. This builds on top of TIGER1 by extending the work on optical control and Multi-Layer / Multi-Region aspects.

The WP4 on “Beyond GMPLS and towards Higher Manageability” introduces, in the context of TIGER2, the notion of autonomic networking applied to transport networks. Starting from a vision of (transport)/telecommunication networks evolution towards autonomic networking, it involves the study of enhanced control plane approaches integrating the notion of autonomic system, including the feasibility (where does it fit in the network “map”) and assessment of gains of self-* features (i.e. the study cases identified in TIGER2).

The WP5 on “Experimentation and Testbeds” deals with the experimental validation and demonstration of selected systems conceived in the WP2, WP3 and WP4. It targets specific proof-of-concepts, such as the demonstration of a multi-layer/multi-domain GMPLS control plane for Ethernet over WSON service provisioning; the demonstration of self-management features or the validation of new network paradigms under the scope of “beyond GMPLS”.



Impact

The adoption of the proposed TIGER2 solutions should reduce OPEX/CAPEX and speed-up the automated deployment of new services. The activities in the line of autonomic networking are geared towards pushing the network automation beyond current practice, reducing human intervention.

The experimentation validations set the basis for tangible prototypes that narrow the gap between theory and practice. These prototypes allow the generation of critical performance data, and increase “lab” and “field” trials that showcase the benefits of the technology.

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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