

TIGER2

Together IP, GMPLS and Ethernet Reconsidered, phase 2



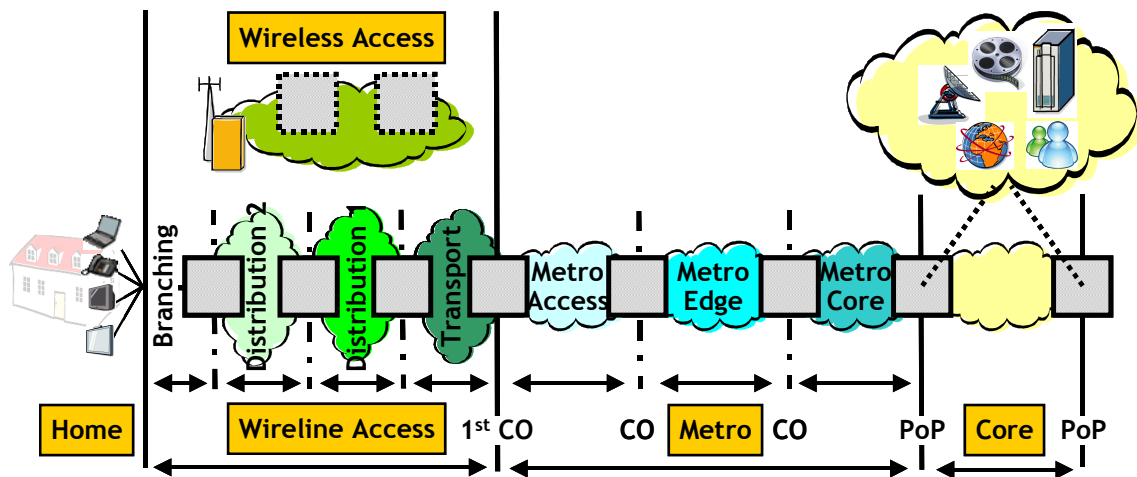
TIGER2 aims at consolidating, both theoretically and experimentally, network architectures that rely on a combined deployment of IP/Ethernet (packet) and optical (transport) technologies in an integrated multi-domain and multi-layer context, leveraging and extending current and ongoing standards. TIGER2 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 the access and core networks segments as well, 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 on access and aggregation networks, as well as core transport segments, under the common notion of technology (IP/Ethernet/DWDM) integration. 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 shortcomings, and validate them by means of simulation and experimentation.

Main results

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

- Simplified/Unified/De-segmented/De-Layered [PON]
- Using Packet-based data plane
- Optimized for resilient content/video distribution/delivery including multicast/multipoint

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) in single and multi-domain core/transport networks, along with an in-depth analysis of the relevance/gains of introducing a L2 switching layer between IP and WDM “layers”. This builds on top of TIGER1 by extending the work on optical control and Multi-Layer / Multi-Region aspects.

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/extended control plane approaches integrating the notion of AN, including the feasibility (where does it fit in the network “map”) and assessment of gains of (some) self-* features (i.e. the study cases identified in TIGER2).

WP5 on “**Experimentation and Testbeds**” deals with the experimental validation and demonstration of selected systems conceived in 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.

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