BONE Major Achievments

WP22 : MPLS, GMPLS and routing

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WP Objectives

The objective of BONE's WP22 Topical Project on MPLS, GMPLS and routing has been to research on key issues in the evolution of IP-MPLS multi-service networks towards all-optical IP-MPLS-GMPLS networks. Under this lemma a number of Joint Activities were carried out.

Status at start of the BONE-project

The networking industry had not a clear understanding of how IP, MPLS and GMPLS could be integrated and provide added-value to operator's networks. The evolution of Optical Transport Networks to satisfy the requirements of ISPs and IP routing was a big open issue. Concepts such as Translucent Optical Networks hadn't been addressed yet from the control plane viewpoint, and capabilities such as multi-domain optical connections and multi-domain MPLS-based VPNs were simply non-existent. The PCE (Path Computation Element) IETF working group was just chartered.

Major progress during BONE-project

BONE-WP22 has achieved a significant impact in the networking community: **34 papers** have been published in the most prestigious journals and conferences thanks to the synergy of experts in *routing, signalling , optical transport networks design and operation, Internet Architecture, network protection, physical impairments at the optical layer, optical fiber transmission, multicast, VPN and carrier Ethernet technologies*. Most relevant results include the development of the concept of dynamic translucent optical networks proposing Quality of Transmission (QoT)-aware GMPLS signalling extensions, the study of distributed and centralised path computation alternatives including real PCE prototypes, the modelling of blocking probabilities, and new multi-layer multi-domain interconnection techniques. Ultimately, BONE-**WP22 has provided key advances towards a Future All-Optical Internet** by fostering discussion on this important issue and proposing both evolutionary and disruptive ideas on how global IP networks can evolve into a smart dependable ultra-broadband system with the efficient and cost-effective support of an underlying multi-domain intelligent optical network.

Added value of the BONE NoE

BONE WP22 has fostered the creation a number of research project proposals on control plane issues of optical networks, some of them successful like STRONGEST, and others are underway for future calls. WP22 activity was also aligned with on-going research in national projects and was also the main contributor to an international workshop on MPLS/GMPLS. Furthermore, eight fruitful mobility exchanges: SSSUP-AIT, DTU-UC3M, UPCT-UC3M, IBBT-UC3M, UC3M-COM, IBBT-UEssex, UEssex-IBBT, UC3M-UPVLC wouldn't have been possible without BONE WP22 activity.