A New Approach for Managing Traffic of Overlay Applications of the SmoothIT Project

Motivation
- Overlay networks generate most of the traffic in current networks (around 80%)
- This traffic increases, since more bandwidth is available in end nodes
- ISPs aim to control and manage the network traffic from overlays to reduce interconnection costs and to avoid QoE degradation for end users

Main SmoothIT objective
To define ETM (Economic Traffic Management) mechanisms in interactions between overlay and underlay to:
- Reduce ISPs’ costs, thus enable ISPs to offer lower prices to end users,
- Improve QoS for overlay applications.

File Sharing (eDonkey)
- Adapting overlay topology to underlay topology to speed up file transfer and to reduce inter-domain traffic
- QoS differentiation for real-time applications as an ISP offer

VoD (Joost)
- Make clients connect to VoD servers and other clients according to underlay information, optimizing ISPs costs
- QoS differentiation taking into account multimedia streaming requirements and end users demands
- Combination of topology awareness and QoS differentiation

Scenario 1: ISP P2P application
An ISP takes part in a P2P overlay application by offering some initial resources and letting users contribute in P2P manner.

Performance improvement
Due to ISP capability to monitor its network usage, the ISPs tracker can steer the content distribution process by implementing:
- Locality awareness
- Efficient bandwidth utilization
- Congestion avoidance

Scenario 2: Service provider and ISP collaboration
- Application controlled by a single service provider, which forms a proprietary overlay network in the backbone
- ISPs offer economic and/or technical incentives to service providers, if they adapt their overlay topologies according to optimal traffic management decisions

Juan Pedro Fernández-Palacios Giménez (jpfpg@tid.es), Maria Ángeles Callejo Rodríguez (macr@tid.es), Hasan Hasan (hasan@ifi.uzh.ch), Tobias Hoßfeld (hossfeld@informatik.uni-wuerzburg.de), Dirk Staehle (staehle@informatik.uni-wuerzburg.de), Konstatin Pussep (pussep@kom.tu-darmstadt.de), Ionna Papafili (papafili06@aueb.gr), George D. Stamoulis (gstamoul@aueb.gr), Burkhard Stiller (stiller@ifi.uzh.ch)