



Hamilton Institute

ClubADSL: Enhancing Bandwidth Aggregation
in your Neighborhood

Dr Domenico Giustiniano
Telefonica Research, Barcelona, Spain

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Abstract:

ADSL is becoming the standard form of residential and small-business broadband access to the Internet due, primarily, to its low deployment cost. These ADSL residential lines are often deployed with Access Points (AP) that provide wireless connectivity. While the ADSL technology has showed evident limits in terms of capacity, the short-range wireless communication can guarantee a similar or higher capacity. Even more important, it is often possible for a residential wireless client to be in range of several other APs belonging to nearby neighbors with ADSL connections. Therefore, it is possible for a wireless client to simultaneously connect to several APs in range and effectively aggregate their available ADSL bandwidth.

Recent works have shown promising results within this area, but main important questions are still unresolved: i) how can we guarantee a fair distributed bandwidth allocation among clients? ii) how the latency of TCP connection can be affected by AP connections over multiple frequencies? iii) how can we minimize the MAC cost of managing these multiple APs? In order to answer to these questions, we introduce ClubADSL, a prototype wireless client that can aggregate the capacity of multi-frequency APs. ClubADSL achieves fairness through distributed pressure schemes and minimizes the impact of end-to-end latency on the system performance with a resource allocation scheme based on Access-Point slot assignment. We show the feasibility of such a system in seamlessly transmitting TCP traffic, and validate its experimental implementation over commodity hardware in controlled scenarios.

[Joint Work with Alberto Lopez, Eduard Goma, Julian Morillo, Pablo Rodriguez].

Bio: Domenico Giustiniano received the MSc degree in Electronic Engineering from the University of Palermo, Italy, in July 2003, and the PhD degree in Telecommunication Engineering in March 2008 from the University of Rome Tor Vergata, Italy. During his MSc thesis, he visited for 8 months the TAIT department, University of Ulm, Germany. In 2004, he worked as research engineer at the TTI Department, University of Palermo, and then moved to the University of Rome Tor Vergata, Italy as PhD student. He spent 2007 as a visiting PhD student at Hamilton Institute, Maynooth, Ireland, where he was involved in a project with Intel Research, CMU Pittsburgh, USA, that he visited during May 2007. In March 2008 he moved to Telefonica Research, Barcelona, Spain, where he is currently a junior researcher. His research activity has been mainly focused on wireless networks and particularly on theoretical work on multi-antenna/multi-code signal processing and experimental research on channel quality in 802.11 networks and WLAN system networks.

Venue: Seminar Room, Hamilton Institute, Rye Hall,
NUI Maynooth

Time: 11.00am - 12.00noon (followed by tea/coffee)

Travel directions are available at www.hamilton.ie