Research report for the STSM of Bruno Tuffin
November 14- November 19, 2010

Host: FTW Vienna, Austria (Peter Reichl)

The STSM has been devoted to developing models related to network economics. The issues dealt with during the week can be summarized by the four following points, and according to deadlines submissions.

1) ***Working on the camera-ready-copy version of a joint paper accepted for publication in Telecommunication Systems Journal***: P. Reichl and B. Tuffin had submitted a paper, along with R. Schalz, entitled "Logarithmic Laws in Service Quality Perception: Where Microeconomics Meets Psychophysics and Quality of Experience" describing the link between utility functions, used in economic models to represent the value of a good or a resource from an end user's point of view, and user experience. It is particularly shown that, for Voice-over-IP and mobile broadband scenarios, there is increasing evidence that user experience and satisfaction follows logarithmic laws. In this paper, they go even one step further and put these results into the broader context of the Weber-Fechner Law, a key principle in psychophysics describing the general relationship between the magnitude of a physical stimulus and its perceived intensity within the human sensory system. This paper has been accepted, but the camera-ready-copy version had to be prepared, following the recommendations of the reviewers. This has been done during this STSM.

2) ***Submission of a paper on economics of security***:following the previous STSMs of B. Tuffin, P. Maillé and B. Tuffin, a paper has been submitted to the ACM Sigmetrics conference. The paper is entitled "Interplay between security providers, consumers, and attackers: a weighted congestion game approach". In this paper, network users can choose among different security solutions to protect their data. Those solutions are offered by competing providers, with different performance and price levels. The interactions among users are modeled as a noncooperative game, with a negative externality coming from the fact that attackers target popular systems to maximize their expected gain. The existence and uniqueness of a user equilibrium is proved, and the corresponding Price of Anarchy computed. The consequences for the (higher-level) pricing game played by security providers is then investigated.

3) ***Discussion on joint works for the Econ@Tel white paper***: P. Reichl and B. Tuffin have also discussed the possible joint content of Econ@Tel white paper: a chapter on QoE and utility functions, one on security and game thoery, one on network neutrality issue, a new problem for them, on which they have submitted a project in France.

4) ***One-day meeting on adword auctions***: On the Friday, P. Reichl has organized at FTW a seminar on the issue of adword auctions and how search engines

make money. There were talks from M. Henzinger (Professor at the Institute for Distributed and Multimedia Systems at the University of Vienna and former Director of Research at Google), expert in the area, and a presentation of B. Tuffin on his recent works on that topic. The talks were followed by discussions with FTW members, and on common interests.