『Tsinghua Information Forum』
#80

Title: (Non-)Asymptotic Per-Flow Capacity in Multi-Access Networks with Bursty Traffic

Speaker: Florin Ciucu
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Time: 10:00am, Wednesday, 2011-11-30

Venue: Room 1-315, FIT Building, Tsinghua

Abstract：

The practicality of available (throughput) capacity results in multi-access networks, which dispense with coding schemes, is often questioned for several reasons including 1) the underlying asymptotic regimes, and 2) the assumption of saturated traffic sources.

In this talk we present a methodology, based on the stochastic network calculus, which addresses these limitations by providing capacity results in non-asymptotic regimes, i.e., holding at all time scales and network sizes, for the very broad class of exponentially bounded burstiness (EBB) traffic sources. Both upper and lower bounds on capacity are derived in terms of probability distributions, which immediately yield all the moments. The explicit and closed-form nature of the results enable the investigation of the impact of burstiness on non-asymptotic network capacity. In particular, the results show that for the EBB class the non-asymptotic end-to-end capacity rate decays linearly in the number of hops.

Biography:

Florin Ciucu was educated at the Faculty of Mathematics, University of Bucharest (B.Sc. in Informatics, 1998), George Mason University (M.Sc. in Computer Science, 2001), and University of Virginia (Ph.D. in Computer Science, 2007). Between 2007 and 2008 he was a Postdoctoral Fellow in the Electrical and Computer Engineering Department at the University of Toronto. Currently he is a Senior Research Scientist at Deutsche Telekom Laboratories (T-Labs) and TU Berlin. His research interests are in the stochastic analysis of communication networks, resource allocation, and randomized algorithms. Florin is a recipient of the ACM Sigmetrics 2005 Best Student Paper Award.

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