
ECN and the TCP Paradigm

by Teunis J. Ott

Date: February 13, 2001 (Wednesday)
Time: 2:30 pm (refreshment starts at 2:15pm)
Place: 202 ECEC, NJIT

About the Speaker

Teunis J. Ott is a Professor in the Department of Computer Science at NJIT. Before joining NJIT he was, for 23 years, a researcher in computer networking and computer performance at Bell Laboratories, Bellcore, and Telcordia.

Dr Ott studied mathematics at the University of Amsterdam and Operations Research at the University of Rochester. He probably is currently best known for his work on the Square Root Law for TCP.

About the Talk

In TCP, packet loss is used by the source of a TCP flow to gauge congestion and to adapt the congestion window to the level of congestion in the network. In RED, this mechanism is used by routers to signal, by preemptively dropping packets, congestion to the sources.

ECN (Explicit Congestion Notification, see RFC 3168, Floyd and Ramakrishnan, Sept 2001) replaces “dropping” with “marking” as the signaling mechanism. The most obvious advantage is that marked packets do not need to be re-transmitted. Derived advantages are that the marking rate can be arbitrarily large, and thus the amount of information “signaled” can be much greater.

This allows for jointly designing new router- and source behaviors.

The most likely payoff of such a joint design is to make it possible for “best effort” type traffic to efficiently utilize the bandwidth left unused by higher priority (say VoIP, Video) traffic.

A mathematical model that illustrates the kind of investigation required will be presented, and simulation results show that even with a fairly naive approach it is possible to improve QoS to low priority traffic, without doing damage to higher priority traffic.

Preparatory reading can be found in <http://web.njit.edu/~ott/Papers/index.html>: Square Root Law, ECN, and Milcom2001 .

Sponsors: IEEE Communications Society North Jersey Chapter
NJIT Department of Electrical and Computer Engineering
NJIT Department of Computer Science