

BCWS Seminar Series

Soft-TDMAC: A Software TDMA-Based MAC over Commodity 802.11 Hardware

by

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Time: Wednesday, November 25, 1:30 - 2:30 pm

Place: Room 4356, Mackenzie Building, Carleton University

Abstract: We design and implement Soft-TDMAC, a software Time Division Multiple Access (TDMA) based MAC protocol, running over commodity 802.11 hardware. Soft-TDMAC has a synchronization mechanism, which synchronizes all pairs of network clocks to within microseconds of each other. Building on pairwise synchronization, Soft-TDMAC achieves network wide synchronization. With, out-of-band, network wide synchronization Soft-TDMAC can schedule arbitrary TDMA transmission patterns. We summarize hundreds of hours of testing Soft-TDMAC on a multi-hop testbed. Our experimental results show that Soft-TDMAC synchronizes multi-hop networks to within a few microsecond sized TDMA slots. Soft-TDMAC can schedule transmissions to take end-to-end demands into account and in a way that decreases end-to-end delay. With no collisions, under good channel conditions, TCP achieves almost the full wireless channel bandwidth.

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Biography: Petar Djukic received B.A.Sc., M.A.Sc. and Ph.D. degrees from the University of Toronto in 1999, 2002 and 2008, respectively. From 2008 to 2009 he was a postdoctoral researcher at the Department of Systems and Computer Engineering, Carleton University, Ottawa, Canada. From 2007 to 2008 he was a postdoctoral researcher at the Department of Computer Science, University of California, Davis. From 1999 to 2001 he worked as a software designer in Ottawa, Canada. His research interests are in wireless multi-hop scheduling and resource allocation and testbed implementations of new wireless MAC protocols.