

Illinois Center for Wireless Systems

ICWS Seminar Series

Traffic Differentiation in Multihop Wireless Networks

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Tuesday, April 3, 2007, 4:00 p.m.
3124 Siebel Center

Abstract: After WLAN's phenomenal commercial success, multihop wireless networks, including wireless sensor networks, wireless mesh networks, and mobile ad-hoc networks, are expected to lead in the next wave of deployment. From a user's perspective, not only do these networks enable ubiquitous communication, but also they should provide means to support diverse application requirements, particularly, the ability to differentiate various types of data flows and ensure quality of service.

In this talk, we discuss the challenges and solutions for several fundamental problems in multihop wireless networks, including end-to-end weighted bandwidth allocation, bandwidth assurance, and performance/overhead tradeoff in traffic differentiation. The problem scope covers a variety of network conditions, including single-commodity or multi-commodity flows, single-path or multi-path routing, and static or highly-dynamic wireless networks. We present two classes of hop-by-hop, routing-independent, light-weight solutions based on aggregate state and packet labels, respectively. Without maintaining any per-flow state, these solutions are able to implement traffic differentiation under aggregate or weighted maxmin models and have great flexibility in adaptation based on network/traffic conditions.

Biography: Shigang Chen received his M.S. and Ph.D. degrees in computer science from University of Illinois at Urbana-Champaign in 1996 and 1999, respectively. After graduation, he worked with Cisco Systems on network security management for three years before joining University of Florida as an assistant professor in the Department of Computer & Information Science & Engineering. He received the NSF CAREER award in 2007 and IEEE Communications Society Best Tutorial Paper Award in 1999. He served as a vice TPC chair for IEEE MASS 2005, a vice general chair for QShine 2005, a TPC co-chair for QShine 2004, and is serving as a symposium TPC co-chair for ICCCN 2007. His research interests cover wireless networks, network security protocols, and quality of service. His email address is sgchen@cise.ufl.edu.