
Understanding the Unfair Behavior of IEEE 802.11 Wireless LANs

by Yigal Bejerano, Bell Laboratories, Alcatel-Lucent

Date: September 16, 2010 (Thursday)
Time: 6:15 pm (refreshment starts at 6:00 pm)
Place: 202 ECEC, NJIT

About the Speaker

Yigal Bejerano received his B.Sc. in Computer Engineering in 1991 (summa cum laude), his M.Sc. in Computer Science in 1995, and his Ph.D. in Electrical Engineering in 2000, from the Technion - Israel Institute of Technology, Haifa, Israel. He is currently a member of the technical staff (MTS) at Bell Laboratories, Alcatel-Lucent. His research interests are mainly management aspects of high-speed and wireless networks, including the areas of mobility management, network monitoring, topology discovery and QoS and fault resilience routing. Dr. Bejerano has published over 40 papers in the main venues of the networking research community and he holds 30 patents and pending patent applications. Dr. Bejerano is on the technical program committee (TPC) of numerous conferences.

About the Talk

In recent years, IEEE 802.11 wireless LANs (WLANs) have been rapidly deployed all over the world at numerous cities, enterprises and universities. These networks provide high bandwidth to mobile users by deploying low-cost wireless access points. Several equipment vendors such as Cisco and SpectraLink have introduced 802.11 phones for providing wireless phone service in these networks and it is expected that the emerging IEEE 802.11n standard will support video traffic. To make such efforts successful, however, certain serious shortcomings of WLANs must be overcome. These include the lack of fair service for data users and the inability to provide quality of service (QoS) guarantees for real-time (RT) services, such as voice and video.

In this talk, I will address the challenges of providing fairness and QoS support in WLANs without changing the standard. I will start with a short overview of the IEEE 802.11 medium access control (MAC) standard and the obstacles that it raises for providing fairness and QoS support. I will show that even in the case of a small network with two access points, a user may not get any service and be practically starved. Then, I will describe a few management schemes for improving the fair service provided to mobile users, while preserving high throughput of the wireless networks. These schemes are based on efficient usage of the 802.11 standard as well as advanced algorithms.

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