Impact of Multicast Flow for Performance of IEEE 802.11e in Wireless LAN

Howard Brown*, Min Gyung Kwak**, Jinsuk Baek***, Paul S. Fisher***

*The Agency Consulting Group, Columbia, MD, USA

**Pangyo R&D Center, Samsung Techwin, Korea

***Department of Computer Science, Winston-Salem State University, Winston-Salem, NC, USA

nebrown@nsa.gov, baekj@wssu.edu, m.kwak@samsung.com, fisherp@wssu.edu

***Abstract*— In IEEE 802.11e, a multicast sender transmits multicast frames using a simple broadcasting mechanism at a low, fixed, rate without binary exponential back-off process. This simplicity reveals unfair shared channel access between unreliable multicast flows and reliable unicast flows. In this paper, we evaluate how negatively the single multicast flow affects multiple the unicast flows when they compete for a single communication channel access. We also observe the transition of the channel condition by progressively applying conservative back-off scheme for the multicast flow. Our evaluation indicates the channel condition-adaptive, back-off scheme for multicast flow is required to alleviate the negative impact and ultimately provide more reliable multicast transmission as well as fair resource sharing with the low-priority unicast flows.**

Keyword— **IEEE 802.11e, Multicast, Fairness, Performance evaluation, Contention window**

Min Gyung Kwak received his B.S. degree in Computer Science from Winston-Salem State University (WSSU), Winston-Salem, NC in 2009, and his M.S. degree in Computer Science from Illinois Institute of Technology (IIT), Chicago, IL in 2012. He worked for Wake Forest Baptist Medical Center as an Intern. He was a member of the Network Protocol Research Group at the WSSU. He is currently working at the Samsung Techwin. His research interests include network communication protocols, and network security protocols.