

Retransmission Control Scheme for RDM Protocol for Lightning Control Networks

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

*Pangyo R&D Center, Hanhwa Techwin, Korea

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

m.kwak@hanhwa.com, baekj@wssu.edu, fisherp@wssu.edu

Abstract— In lighting control networks, remote device management is supported by the Remote Device Management (RDM) protocol. However, the RDM protocol does not provide any mechanism for reliable packet transmission. For reliable transmission, a controller needs to integrate the status information of its lightning devices and perform error recovery for these devices using the data stored in its buffer. We propose a retransmission control scheme that uses two types of ACKs. The proposed scheme significantly reduces ACK implosion at the controller and ultimately provides scalable reliable device management for the lighting control network.

Keyword— Reliable transmission; Lighting control network; RDM; DMX-512A



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 Hanhwa Techwin. His research interests include network communication protocols, and network security protocols.



Jinsuk Baek (M'04) is Associate Professor of Computer Science at the Winston-Salem State University (WSSU), Winston-Salem, NC. He is the director of Network Protocols Group at the WSSU. He received his B.S. and M.S. degrees in Computer Science and Engineering from Hankuk University of Foreign Studies (HUFS), Korea, in 1996 and 1998, respectively and his Ph.D. in Computer Science from the University of Houston (UH) in 2004. Dr. Baek was a post doctorate research associate of the Distributed Multimedia Research Group at the UH. He acted as a consulting expert on behalf of Apple Computer, Inc in connection with Rong and Gabello Law Firm which serves as legal counsel to Apple computer. He has served on an Editor of the KSII Transactions on Internet and Information Systems. He also served or currently serving as a reviewer and Technical Program Committee for many important Journals/Conferences/Symposiums/Workshop in Computer Communications Networks area. His research interests include wireless sensor networks, scalable reliable communication protocols, mobile computing, network security protocols, proxy caching systems, and formal verification of communication protocols. He is a member of the IEEE.



Paul S. Fisher is R. J. Reynolds Distinguished Professor of Computer Science at the Winston-Salem State University (WSSU), Winston-Salem, NC. He is the director of High Performance Computing Group at the WSSU. He received his B.A. and M.A. degrees in Mathematics from University of Utah and his Ph.D. in Computer Science from Arizona State University. He has written and managed more than 100 proposal efforts for corporations and DoD involving teams of 1 to 15 people. He worked as consultant to the U.S Army, U.S Navy, U.S Air Force and several companies over the years. In the 1990's he commercialized an SBIR funded effort and built Lightning Strike, a wavelet compression codec, then sold the company to return to academe. His current research interests include wired/wireless communication protocols, image processing and pattern recognition.