A Novel Multimedia Streaming System for Urban Rail Environments Using Wi-Fi Peer-to-Peer Technology

The amount of streaming multimedia data delivered to mobile devices is growing at a high rate. Research shows that a large number of daily commuters stream audio and video to their mobile devices during their travels. This makes urban rail environments a suitable platform for delivering entertainment, information and advertisement multimedia using novel delivery techniques. In order to do so, the system presented in this paper utilizes the unused bandwidth of a Communications-Based Train Control link to transmit multimedia to urban trains. Once on the train, multimedia is distributed to passenger devices using Wi-Fi Peer-to-Peer (P2P) technology. Such a multimedia distribution system can be deployed incrementally, as it can function concurrently with Wi-Fi connections already available in a number of trains. This paper presents the results obtained by emulating multimedia streaming in an urban rail use-case. Namely, it evaluates the received streaming multimedia quality parameters when new users arrive or existing users are replaced during the train stops.