Managing Wireless IPTV in Multimedia Home Networking

Kandaraj Piamrat*, Patrick Fontaine**, César Viho*

INRIA/IRISA, Campus de Beaulieu 35042, Rennes, France

**Technicolor, 975 avenue des Champs Blancs 35510, Cesson-Sévigné, France*

kandaraj.piamrat@inria.fr, patrick.fontaine@technicolor.com, cesar.viho@irisa.fr

Abstract—In-home wireless networks are now wide-spreading as today's home network is composed of at least one wireless network. The dramatic increase of traffic makes it difficult to guarantee user experience. In this paper, we focus on wireless IPTV service that needs to be guaranteed by service provider. It is particularly complicated to manage because of the shared and unstable condition of the wireless medium. Moreover, with stringent requirements at application layer, using UDP at transport layer and traditional MAC protocol at link layer can hardly result in satisfaction at users. Therefore, we investigate comparison of different combinations of transport and link layer performances for the delivery of IPTV. For validation, we use NS-3 and a realistic propagation generated with a real house description. We analyze impact of link layer (with or without coordination) and transport layer (UDP or TCP). Then, we propose a combined solution using TCP over a coordinated MAC protocol. The solution can be easily deployed in real products and is compatible with existing devices.

Keyword—IPTV, Multimedia Streaming, Wireless Networks, Home Network, TCP

Kandaraj Piamrat received the Engineering degree (*Diplôme Ingénieur*) in Computer Network from Ecole Polytechnique de l'Université de Grenoble (France) in 2005. She has done her exchange program at University of Texas at Austin where she obtained a university honor. After that, she has pursued her PhD thesis at INRIA in Rennes (France) from 2007 to 2010 where she received her Doctoral degree in Computer Sciences with highest honor. She has been visiting researcher at VTT research center of Finland in Oulu in 2008 and National Institute of Informatics (NII) in Tokyo, Japan in 2010. She has also been postdoctoral fellow at Technicolor, Cesson-Sévigné, France from 2010-2012. Dr. Piamrat is now working at Université de Rennes 1 and INRIA, Rennes, France. Her research interests concern resource management in wireless network with a particular focus on quality of experience (QoE) for multimedia services.

Patrick Fontaine received the Engineering degree in Electrical and Communication System Engineering in 1997 from National Institute of Applied Sciences (France), and the Master degree in Electrical Engineering from University of Rennes 1. He is working at Technicolor Research & Innovation in the Media Computing laboratory. He has been a research engineer at Thomson research since 1998, working alternatively on video delivery for home networks and professional broadcast studios. His research interests concern Wireless systems and Network architectures for the delivery of multimedia services and for new interactive services (localization, presence detection); Home networking, Security.

César Viho received his PhD diploma in computer sciences from University of Bordeaux (France) in 1991. Since 1992, he joined the computer sciences department ISTIC of University of Rennes 1 (France), where he obtained his HdR ("Habilitation à diriger les Recherches") and a Professor position in 2006. His research activity is done in IRISA laboratory. Currently, he is head of the "Network, Telecommunication and Services" research department. His interests include interoperability testing, resource management in wireless networks and real-time multimedia delivery over IP-based networks. He participated in several European and international projects and he published several papers on those topics.