

Chapter 7.37

Multimedia over Wireless Mobile Data Networks

Surendra Kumar Sivagurunathan
University of Oklahoma, USA

Mohammed Atiquzzaman
University of Oklahoma, USA

ABSTRACT

With the proliferation of wireless data networks, there is an increasing interest in carrying multimedia over wireless networks using portable devices such as laptops and personal digital assistants. Mobility gives rise to the need for handoff schemes between wireless access points. In this chapter, we demonstrate the effectiveness of transport layer handoff schemes for multimedia transmission, and compare with Mobile IP, the network layer-based industry standard handoff scheme.

I. INTRODUCTION

Mobile computers such as personal digital assistants (PDA) and laptop computers with multiple network interfaces are becoming very common. Many of the applications that run on a mobile computer involve multimedia, such as video

conferencing, audio conferencing, watching live movies, sports, and so forth. This chapter deals with multimedia communication in mobile wireless devices, and, in particular, concentrates on the effect of mobility on streaming multimedia in wireless networks.

Streaming multimedia over wireless networks is a challenging task. Extensive research has been carried out to ensure a smooth and uninterrupted multimedia transmission to a mobile host (MH) over wireless media. The current research thrust is to ensure an uninterrupted multimedia transmission when the MH moves between networks or subnets. Ensuring uninterrupted multimedia transmission during handoff is challenging because the MH is already receiving multimedia from the network to which it is connected; when it moves into another network, it needs to break the connection with the old network and establish a connection with the new network. Figure 1 shows an MH connected to Wireless Network

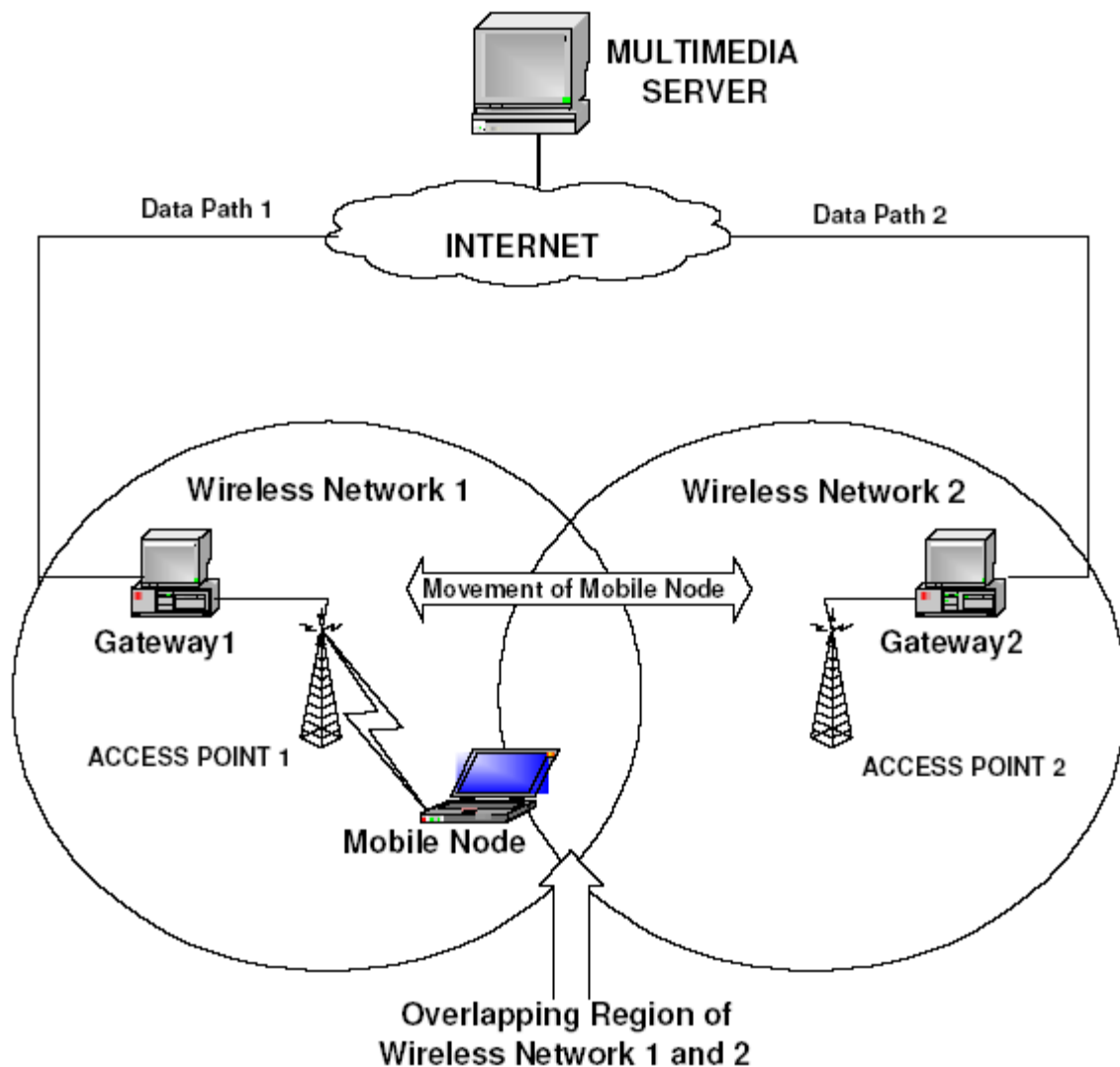
1; when it moves, it has to make a connection with the new network, say Wireless Network 2. The re-establishment of a new connection takes a considerable amount of time, resulting in the possibility of interruption and resulting loss of multimedia.

The current TCP/IP network infrastructure was not designed for mobility. It does not sup-

port handoff between IP networks. For example, a device running a real-time application, such as video conference, cannot play smoothly when the user hands off from one wireless IP network to another, resulting in unsatisfactory performance to the user.

Mobile IP (MIP) (Perkins, 1996), from the Internet Engineering Task Force (IETF), addresses

Figure 1. Illustration of handoff with mobile node connected to Wireless Network 1



19 more pages are available in the full version of this document, which may be purchased using the "Add to Cart" button on the publisher's webpage:

www.igi-global.com/chapter/multimedia-over-wireless-mobile-data/26714

Related Content

Performance Testing of Mobile Applications on Smartphones

Abdurhman Albasir, Valuppillai Mahinthan, Kshirasagar Naik, Abdulhakim Abogharaf, Nishith Goeland Bernard J. Plourde (2014). *International Journal of Handheld Computing Research* (pp. 36-47).

www.irma-international.org/article/performance-testing-of-mobile-applications-on-smartphones/137119

City Networks in Cyberspace and Time: Using Google Hyperlinks to Measure Global Economic and Environmental Crises

Andrew Boulton, Lomme Devriendt, Stanley D. Brunn, Ben Derudder and Frank Witlox (2011). *ICTs for Mobile and Ubiquitous Urban Infrastructures: Surveillance, Locative Media and Global Networks* (pp. 67-87).

www.irma-international.org/chapter/city-networks-cyberspace-time/48345

Recommendation System: A Potential Tool for Achieving Pervasive Health Care

Shashi Kant Srivastava and Sudipendra Nath Roy (2018). *Next-Generation Mobile and Pervasive Healthcare Solutions* (pp. 111-127).

www.irma-international.org/chapter/recommendation-system/187519

Wireless Network Security

K. Curran (2007). *Encyclopedia of Mobile Computing and Commerce* (pp. 1022-1027).

www.irma-international.org/chapter/wireless-network-security/17213

Mobile e-Learning for Next Generation Communication Environment

Tin-Yu Wu and Han-Chieh Chao (2009). *Mobile Computing: Concepts, Methodologies, Tools, and Applications* (pp. 3349-3360).

www.irma-international.org/chapter/mobile-learning-next-generation-communication/26728