

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

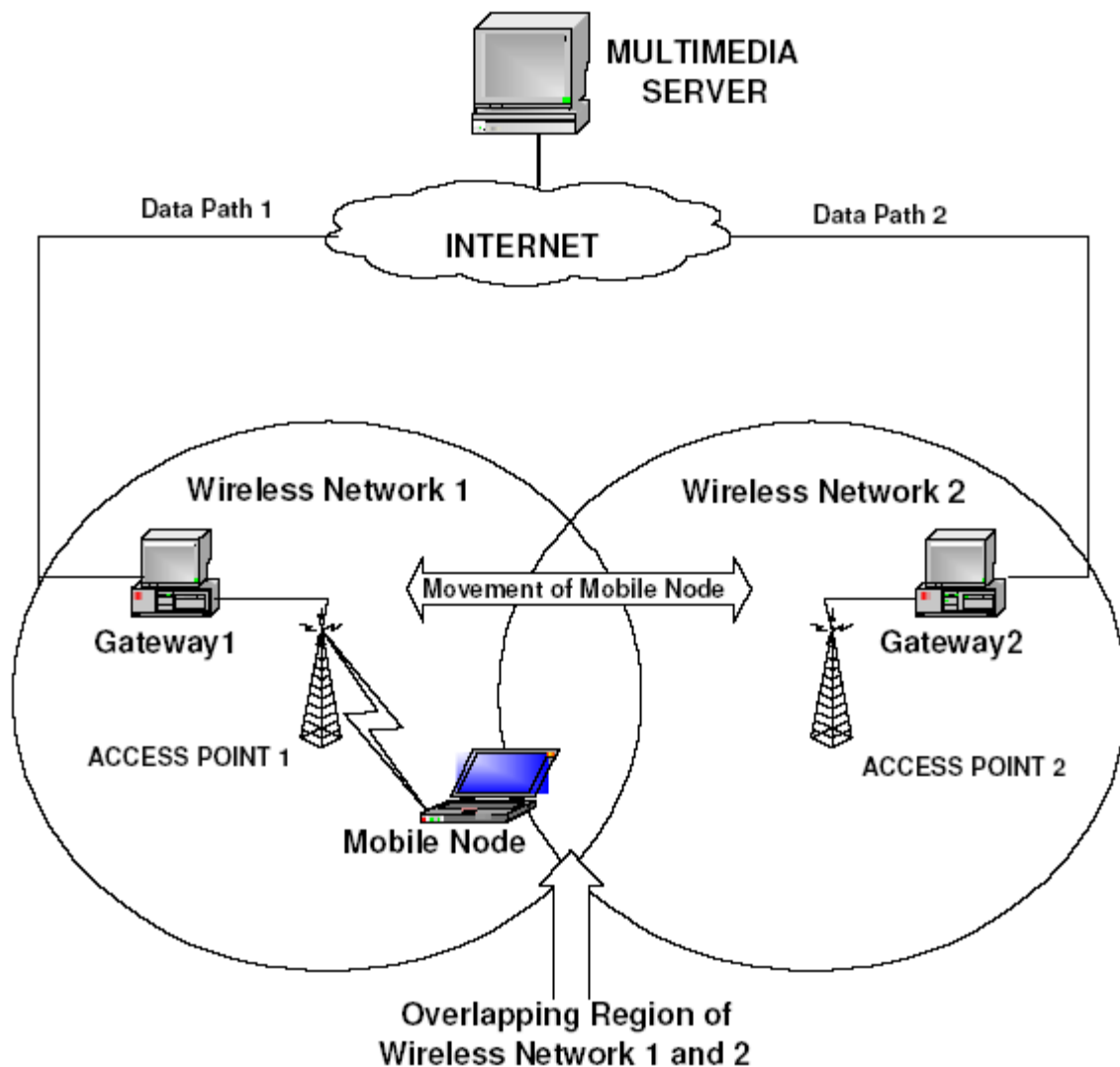
1; when it moves, it has to make a connection with the new network, say Wireless Network 2. The re-establishment of a new connection takes a considerable amount of time, resulting in the possibility of interruption and resulting loss of multimedia.

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

Network Optimization Methods for Self-Organization of Future Cellular Networks: Models and Algorithms

Furqan Ahmed, Alexis A. Dowhuszko and Olav Tirkkonen (2016). *Self-Organized Mobile Communication Technologies and Techniques for Network Optimization* (pp. 35-65).
www.irma-international.org/chapter/network-optimization-methods-for-self-organization-of-future-cellular-networks/151134

Enhancing Data Availability in MANETs with Cooperative Caching

Prashant Kumar, Naveen Chauhan, Lalit K. Awasthi and Narottam Chand (2013). *Contemporary Challenges and Solutions for Mobile and Multimedia Technologies* (pp. 271-285).
www.irma-international.org/chapter/enhancing-data-availability-manets-cooperative/70821

The Nexus of M-Health and Self-Efficacy

Anastasios S. Moumtzoglou (2016). *M-Health Innovations for Patient-Centered Care* (pp. 341-365).
www.irma-international.org/chapter/the-nexus-of-m-health-and-self-efficacy/145018

Using Mobile Phones for Assessment in Contemporary Classrooms

Fusun ahin and Dominic Mentor (2016). *Handbook of Research on Mobile Learning in Contemporary Classrooms* (pp. 116-138).
www.irma-international.org/chapter/using-mobile-phones-for-assessment-in-contemporary-classrooms/157977

Towards Cash-Less Economy: Examining Factors Influencing Intention to Use NFC-Based Mobile Payments

Deogratius Mathew Lashayo and Julius Raphael Athuman Mhina (2022). *International Journal of Mobile Devices, Wearable Technology, and Flexible Electronics* (pp. 1-24).
www.irma-international.org/article/towards-cash-less-economy/311432