

**MECHATRONICS BOOK SERIES**  
**SELECTED PAPERS FROM**  
**ICOM'01, ICOM'05 AND**  
**ICOM'08**

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## **Performance Study of Intra-Domain Mobility Management**

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### **ABSTRACT**

Mobile IPv6 (MIPv6) describes how mobile node can change its point of attachment from one access router to another. Hierarchical Mobile IPv6 (HMIPv6) is the proposed enhancement for Mobile IPv6 that is designed to reduce the amount of signaling required and to improve handover speed for mobile connections. This is achieved by introducing a new network entity called Mobility Anchor Point (MAP). The former protocol deals within an inter-domain architecture and the latter in an intra-domain system. This study makes a comparison between these protocols. The architecture and operation of each protocol is studied and they are evaluated based on the QoS parameters such as, packet loss, throughput and signaling overhead. The simulation was carried out using the Network Simulator-2. The outcome from these results has been discussed.

### **1. INTRODUCTION**

Wireless LAN is gaining a strong foothold in the market among the emerging technologies for the broadband wireless access and has become an extremely fast-paced industry due the great convenience it offers. The rapid Internet evolution together with the tremendous growth in the number of wireless users has results in a strong convergence trend towards usage of Internet Protocol (IP) as the common network protocol for both wired and wireless mobile networks. Such all-IP network will ensure mobile service continuity while users roaming through different wireless systems. The Internet Engineering Task Force (IETF) working group in Mobile IP is proposing Mobile IPv4 and Mobile IPv6 as the main protocols for providing IP mobility support. This proposal seems to work fine when movement of a mobile node is infrequent and once connected at a new network, it stays for long period. However, for situation where the mobile node reaches another network and change its point of attachment frequently, the standard Mobile IP would generate significant signaling load. This has been shown to result in high layer-3 handover latencies, which lead to packet loss and IP mobility performance degradation. Therefore, the Hierarchical MIPv6 (HMIPv6) [1] is a protocol developed by the IETF that tries to overcome the shortcomings of MIPv6 on signaling load and handover latencies.

Mobility management refers to location and handover management. In this paper, we present a detailed performance analysis of the Hierarchical Mobile IPv6 and Mobile IPv6 protocols. The paper is organized as follows. Section 2 describes briefly the protocol overview followed by Section 3 which points out some of the related researches. The simulation of proposed topology is mentioned in section 4. Section 5 presents the results and discussion, followed by the conclusion and future work in section 6.

### **2. PROTOCOL OVERVIEW**

In intra-domain mobility, a Mobile Node (MN) moves within the domain. A domain is an arbitrary structure. It can be an ISP network, a campus network, a company network, and a set of LANs or even a single LAN. In this paper, we define a domain as the highest level of the hierarchical architecture.