

ABSTRACT

Mobile Internet Protocol Version 6 (MIPv6) is a network protocol that enables mobile devices to maintain connectivity to the internet even when transitioning between different networks. This transition process, known as handover, often causes disruptions such as delay, packet loss, and a degradation in service quality. Fast Mobile IPv6 (FMIPv6) is a solution developed to mitigate these issues, designed to accelerate and enhance the efficiency of the handover process compared to the standard MIPv6 protocol.

This study aims to analyze the performance of FMIPv6 under mobile network handover conditions, comparing it against MIPv6, particularly at critical points of user density and mobile node speed. Simulations were conducted using OMNeT++ software to evaluate its impact on throughput and packet loss parameters. The results indicate that MIPv6 is highly vulnerable to high speeds and high user density, with packet loss reaching 6.43% and throughput at 1.209 Mbps in the scenario of 50 users at 10 mps. Conversely, FMIPv6 demonstrates significantly better resilience under these extreme conditions, with packet loss at only 0.70% and throughput at 1.624 Mbps. Although delay for both protocols was identical (370 ms) across all scenarios, FMIPv6 proved to be more efficient and reliable in maintaining connectivity quality during handover.

Keywords: *FMIPv6, Mobile network, Handover, Packet loss, Delay, Throughput.*