

Fast handoff scheme for cluster-based proxy mobile IPv6 protocol

ABSTRACT

Proxy Mobile IPv6 (PMIPv6) was standardized to reduce the long handoff latency, packet loss and signaling overhead of MIPv6 protocol and to exempt the mobile node from any involvement in the handoff process. However, the basic PMIPv6 does not provide any buffering scheme for packets during MNs handoff. In addition, all the binding update messages are processed by a Local Mobility Anchor (LMA) which leads to increase the handoff latency. Previous works enhanced PMIPv6 performance by applying fast handoff mechanisms to reduce the packet loss during handoffs; however, the LMA is still involved during the location update operations. In this paper, we present a new fast handoff scheme based on a cluster-based architecture for the PMIPv6 named Fast handoff Clustered PMIPv6 (CFPMIPv6); it reduces both the handoff signaling and packet loss ratio. In the proposed scheme, the Mobility Access Gateways (MAGs) are grouped into clusters with a one distinguished Head MAG (HMAG) for each cluster. The main role of the HMAG is to carry out the intra-cluster handoff operations and provide fast and seamless handoff services. The proposed CFPMIPv6 is evaluated analytically and compared with the previous work including the basic PMIPv6, Fast PMIPv6 based on Multicast MAGs group (MFPMIPv6), and the Fast Handoff using Head MAG schemes (HFPMIPv6). The obtained numerical results show that the proposed CFPMIPv6 outperforms all the basic PMIPv6, MFPMIPv6, and HFPMIPv6 schemes in terms of the handoff signaling cost.

Keyword: Fast handoff; Handoff latency; Head MAG; Mobility management; PMIPv6