# An analytical framework for distributed and centralized mobility management protocols

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## ABSTRACT

Proxy Mobile IPv6 (PMIPv6) maintains the mobility management of mobile users without involving them in the signaling of mobility process. The main limitations of PMIPv6 are the high latency and packet loss. Consequently, IETF has addressed these limitations by standardizing Fast Handover for Proxy Mobile IPv6 (PFMIPv6) protocols. The whole processes of PMIPv6 and PFMIPv6 protocols, including mobility management and connectivity needs, are based on a centralized and static mobility anchor. Therefore, the centralized anchor usually suffers from enormous burdens and hence degradation in performance, scalability, and reliability of the network. Lately, Distributed Mobility Management (DMM) solution is introduced based on PMPv6 to tackle the issue of relying on a single entity. Analyzing and investigating the performance of these centralized and distributed solutions depends on traffic characteristics and user mobility model. Accordingly, we propose through these two factors an analytical framework to evaluate the handover performance of PMIPv6, PFMIPv6 and DMM in vehicular environment. Our analysis and experimental validation are very significant to determine the impacts of different network parameters on the handover performance of these protocols to facilitate decision making on which analytical framework must be adopted in a network. Analytical results demonstrate that there is a trade-off between network parameters and handover performance metrics. PFMIPv6 is the most suited protocol for low to high mobility scenarios in term of handover performance.

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