AN ENHANCEMENT OF BINDING UPDATE FOR VEHICULAR HMIPv6 IN WIRELESS NETWORK MOBILITY ENVIRONMENT

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Abstract

Recently, network mobility (NEMO) is increasing in a hot topic. Most parts of the traditional NEMO schemes have been designed based upon the NBS (NEMO Basic Support Protocol) in RFC 3963 or the Route Optimization-Hierarchical Mobile IPv6 with NEMO (RO-HMIPv6) in draft. However, the NBS and RO-HMIPv6 suffer from a series of triangular routings (well known as pinball routing problem) and large number of binding update messages, respectively. These problems waste the network resources such as the increased registration cost, handoff latency and packet loss. In this paper, we therefore propose a novel mobility management scheme for layer 3-based (i.e., network layer) NEMO environment, called Vehicle-based HMIPv6 (V-HMIPv6), to eliminate these drawbacks. For supporting the operations of V-HMIPv6, a specific binding cache (SBC) also needs to be elaborately designed in this paper. Our scheme takes the advantages of NBS and RO-HMIPv6 which are with not only the route optimization but also the reduced signal overhead for binding updates generated at the same time by using our proposed SBC function. Moreover, security issue for supporting the V-HMIPv6 scheme should be mentioned in this paper in order to keep secure information during the data delivery. Simulation study has demonstrated that a better performance can be achieved by V-HMIPv6 over than the conventional NEMO-based protocols. Lastly, requirements for SBC-cache in supporting the operations of the V-HMIPv6 scheme demonstrate the moderate overhead in cache size.