Implementation of AAA Server for PMIPv6 in NS-2

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Abstract. Proxy Mobile IPv6 is a network-based mobility protocol where the mobility management signaling is performed by a network entity on behalf of the node requiring mobility itself. Mobile IPv6 (MIPv6) enables Mobile Node (MN) to maintain its connectivity to the Internet during handover. The Mobile Access Gateway (MAG), located in the access router, retrieves the MN profile information from Authentication, Authorization, and Accounting (AAA) server and sends the customized Router Advertisements to the MN, emulating the home network behavior. Theoretically there is an inclusion of AAA server in PMIPV6 but the practical inclusion is not been attempted yet, hence this paper proposes an architecture for including the AAA server into the NS2 for PMIPV6.

Keywords: AAA server, LMA, MAG, Proxy care of address.

1 Introduction

In the current era of technology mobility gained a lot of popularity in terms of allowing the users to access the resource while roaming. The roaming facility is provided to the users using mobile IP. The challenging issue for the industry is to maintain the connectivity during the change of Point of attachment (PoA). There are two models to support the mobility, i.e Network-based and Host based. Network based mobility models allow Mobile Node (MN) to continue their IP sessions as they move from one PoA to another without the involvement of MN in the signaling or management of their movement. This makes the MN unaware of its mobility. This reduces the complexity and cost of MN. IP mobility for nodes that have mobile IP client functionality in the IPv6 stack as well as those nodes that do not, would be supported by enabling Proxy Mobile IPv6 protocol. Therefore it increases compatibility and interoperability between various systems and user equipments. In contrast, in host-based mobility model MN should support Mobile IP to continue their IP sessions as they move from one PoA to another. In this mobility model MN actively involved in the handover management, which includes detecting the new point of attachment, sending binding updates to Home Agent (HA) and correspondent Node (CN) and so on. In comparing to network based mobility model, host based model increases the complexity of Mobile node and compatibility with other network entities.

The rest of the paper is organized as follows. Section 2 describes PMIPv6.Section 3 describes Existing Architecture of PMIPv6 in ns-2. Section 4 describes Proposed

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Architecture of PMIPv6 in ns-2. Section 5 describes implementation of AAA server in NS-2 Section 6 describes Simulation setup. Section 7 describes Simulation results and analysis. Section 8 presents Conclusion.

2 PMIPv6

Brief about PMIPv6

Proxy Mobile IP (PMIP) is a network-based mobility management protocol. It achieves this by using MIPv6's signaling and the reuse of the home agent functionality through a proxy mobility agent in the network. The entire network (Proxy mobile IPv6 domain) within which the MN is authorized to roam is under the same administrative management. Thus, PMIPv6 is called as localized network based mobility management protocol. PMIPv6 relies on the proxy mobility agents in the network to detect the MN's attachments and detachments and then signal this information, in the form of binding updates without the active participation of the MN itself [2]. This scheme defines two core functional elements; Local Mobility Anchor (LMA) and the Mobile Access Gateway (MAG) [3].

Operation of Proxy MIPv6

Every MN in a proxy mobile IP domain is assigned an MN-Identifier which it (MN) presents as part of access authentication when it attaches to MAG in the domain [1]. With this identifier, both the MAG and the LMA can obtain the MN's policy profile from the AAA server. The moment an MN enters its Proxy Mobile IPv6 domain and is authenticated and assigned a home link (address), the network ensures that this home link conceptually follows the MN as it roams within the domain. Fig 1 shows operation of PMIPv6.

The MAG uses this MN-Identifier to look up the MN's policy profile from the AAA server so as to obtain the MN's LMA address. Upon obtaining this address, the MAG will generate and send a PBU message on behalf of the MN to the MN's LMA via the obtained address. This PBU message is intended to update the LMA with the current location of the MN. Obtaining the MN's policy profile also provides the MAG with parameters necessary for emulating the MN's home agent. This means making the MN believe that it's still connected to its HA. After authenticating the request, the LMA will send a PBA response message back to the MAG. If the response that the LMA sent is positive, the LMA will also set up a route for the MN over a tunnel to the MAG. The MAG on receiving the PBA would establish a bi-directional tunnel with the LMA, add a default route through the tunnel to the LMA and finally grant the MN permission to transmit data. All traffic from the MN as well as all other MNs connected to the same MAG and LMA will be routed through this tunnel to the LMA and then to their CNs. On receiving the PBA, the MAG also sends a Router Advertisement to the MN advertising the MN's home network prefix. If the MN has not obtained an IP address by this time, it will generate one using the obtained home network prefix. The method of obtaining or generating an IP address can be by either