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SELECTED PAPERS FROM
ICOM'01, ICOM'05 AND
ICOM'08

Editors

Asan G. A. Muthalif
Amir A. Shafie
Momoh J.E. Salami



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Performance Evaluation of Hierarchical Mobile IP

Aisha Hassan Abdalla, Farhat Anwar, Shaffiah Mohd, Hatina Banun Liyakthalikhan, Sajid Hassan
Department of Electrical and Computer Engineering
Kulliyah of Engineering
International Islamic University Malaysia
aisha@iiu.edu.my, farhat@iiu.edu.my, shaffiah@yahoo.com, hatina_banun@yahoo.com,
sajid@mimos.my

Abstract

In today's fast growing society, mobility has become an important tool to perform handoff over Internet. As the demand for wireless mobile devices increases, many new micro-mobility protocols have been proposed, designed and implemented. In this paper, Hierarchical Mobile IP (HMIP) is compared with Mobile IP(MIP). Mobile IP is a powerful protocol that support Internet mobility but it has certain disadvantages that result in the born of IP micro-mobility protocols. HMIP is one of the solutions preceding the Mobile IP problem. HMIP aims to reduce the registration time, packet loss and signaling overhead experienced during handoff. This IP micro-mobility protocol focuses on performance and scalability issues. One of the main advantages in Hierarchical MIP is that it differentiates between global mobility and local mobility. The aim of this research is to study and provide comparison between Mobile IP and HMIP protocol. Simulation is done for both protocols using ns-2 simulator and trace graph. From the results we can conclude that HMIP is better than Mobile IP in terms of packet loss, delay and signaling overload.

1.0 Introduction

Internet in the age of information offers access to resources worldwide. Typically we tend to receive the benefits when we reach at a location which is familiar in nature be it school, lab or workplace. However, the increasing variety of wireless devices offering IP connectivity such as Personal Digital Assistants (PDAs), handhelds, and digital cellular phones, is beginning to change our perception of Internet[1]. All these are possible via the use of mobile networking. There are some technical obstacles which need to overcome before mobile networking can be used to its potential. The most basic is Internet Protocol, routing packet to its destination based on the IP address. When the packet's destination is a mobile node, this means that each new point of attachment made by the node is associated with a new network number and, hence, a new IP address, making transparent mobility impossible [2].

Mobile IP, a standard proposed by a working group within the Internet Engineering Task Force, was designed to solve this problem by allowing the mobile node to use two IP addresses: a fixed home address and a care-of address that changes at each new point of attachment. Mobile IP, as originally specified, defines an authentication extension (the Mobile-Foreign Authentication extension) by which a mobile node can authenticate itself to a foreign agent [4].

IP version 4 assumes that a node's IP address uniquely identifies the node's point of attachment to the Internet. Therefore, a node must be located on the network indicated by its IP address in order to receive datagrams(packets) destined to it; otherwise, datagrams or packets destined to the node would be undeliverable. For a node to change its point of attachment without losing its ability to communicate, currently one of the two following mechanisms must typically be employed:

- a) The node must change its IP address whenever it changes its point of attachment, or
- b) Host-specific routes must be propagated throughout much of the Internet routing fabric.