QoS AND MOBILE TECHNOLOGIES

EDITORS:

AISHA-HASSAN ABDALLA HASHIM

OMER MAHMOUD

RASHEED SAEED

DEPARTMENT OF ELECTRICAL AND COMPUTER ENGINEERING
INTERNATIONAL ISLAMIC UNIVERSITY MALAYSIA

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Selangor Darul Ehsan
Tel: +603-6188 1542 / 44 / 45 Fax: +603-6188 1543
EMAIL: iiumprinting@yahoo.com

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CHAPTER 8

INTRODUCTION TO MOBILITY MANAGEMENT

SHAYMA SENAN, AISHA HASSAN ABDALLA HASHIM, AKRAM M. ZEKI

ECE Dept. Fac. of Eng., International Islamic Univ. Malaysia (IIUM), Jalan Gombak, 53100 Kuala Lumpur, Malaysia.

shay_sinan@yahoo.co.uk

8.1 OVERVIEW

This part of the book is an insightful and in-depth expository analysis of mobility management approaches. The concept of nested mobile networks is first introduced to the reader and afterwards, a meticulous evaluation of NEMO extensions is provided. Handoff process in micro-mobility protocols is systematically investigated by the authors and furthermore, comparison between network simulators and open issues in NEMO is conclusively given in this book part as a guide to the interested reader for further research.

Nowadays wireless technologies and mobile devices are widely used in IPv6 communication. However Mobile IP and Mobile IPv6 aim at maintaining Internet connectivity while a host is roaming, as users expect to be connected to the Internet from "anywhere" at "anytime". Mobile IPv6, as Mobile IPv4, makes a mobile's movement (i.e., change of IPv6 address) transparent to the upper layer protocols and applications on the mobile as well as on correspondent nodes. Each MIPv6 mobile node has a home network and an IPv6 home address assigned to the MN within the network prefix of its home network. The MN's IPv6 home address does not have to change regardless of where the mobile is. A correspondent node can always address packets to a MN's IPv6 home address. Mobile IPv6 ensures that a MN can receive the packets addressed to its home address regardless of where the mobile is [1].

The key benefit of Mobile IPv6 is that even though the MN changes locations and addresses, the existing connections through which the MN is communicating are maintained. To accomplish this, connections to MNs are made with a specific address that is always assigned to the MN, and through which the MN is always reachable [2].

In Mobile IPv6, any mobile node is identified by its home address regardless of its point of attachment to the Internet. When the mobile node is located away from the home network, it is associated with a care-of-address. The Mobile IPv6 protocol requires registration of care-of-addresses with a home agent, thereby giving the home agent a mobile node's current attachment point to the Internet. The home agent then tunnels all the packets received for the mobile node to the node's present care-of-address. Fig. 8.1 shows the tunneling operations in Mobile IP. The default encapsulation mechanism that must be supported by all mobility agents using Mobile IP is IP-within-IP. Using IP-within-IP, the home agent, the tunneling source, inserts a new IP header or tunnel header, in front of the IP header of any datagram addressed to the mobile node's home address.