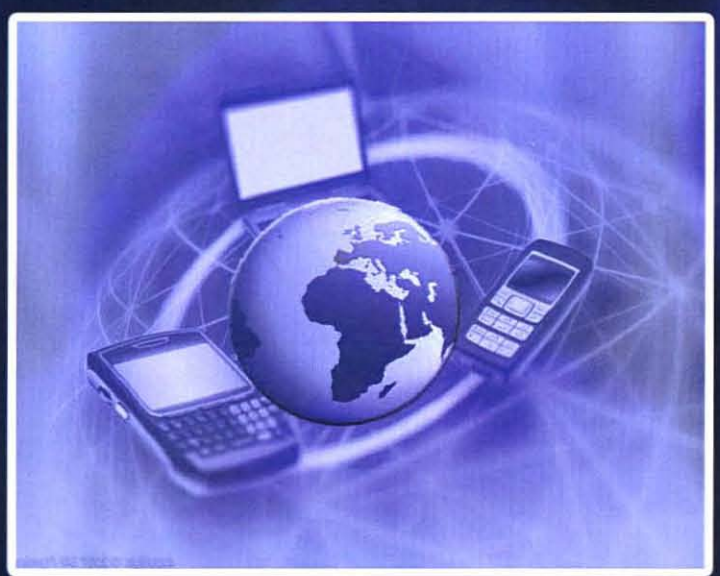
Research Issues in Wireless

Communications and Networking

Farhat Anwar
Wajdi Al-Khateeb



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Tel: +6**03-6188 1542 / 44 / 45** Fax: +6**03-6188 1543**
EMAIL: iiumprinting@yahoo.com

CHAPTER 13
DEPLOYMENT CHALLENGES OF MIPV6

Mosharrof Hussain Masud[1,a], Farhat Anwar[2,b]
[1,2]ECE Dept, Faculty of Engineering, International Islamic University Malaysia (IIUM)
Jalan Gombak, 53100 Kuala Lumpur, Malaysia
[a]masuduia@yahoo.com, [b]farhat@iium.edu.my

13.1 INTRODUCTION

Nowadays, many electronic devices such as mobile handsets, Personal Digital Assistant (PDA), laptop, notebook, digital camera, microwave woven, refrigerator, security sensors, car, webcam, washing machine, television, toaster etc. are facilitated with the Internet connection. To connect all these devices with the Internet, Internet Protocol version 4 (IPv4) was designed in 1970 [1]. When IPv4 was designed, mobility of a device did not consider for its gigantic size. However, as the technology advances, electronic devices become smaller and portable. Among these devices, the mobile handsets are increasing rapidly around the world. Mobile users demand not only better Quality of Services (QoS) but also seamless and uninterrupted communication. To provide satisfactory services to the mobile users, Internet Engineers Task Force (IETF) has been developed Mobile Internet Protocol (MIP) protocol [2]. MIP can be categorized into two parts, the existing MIP version 4 (MIPv4) and coming MIPv6. MIPv4 was developed during 1993 to 1998 [3]. The address length of IPv4 is 32 bits (2^{32}) that has around 4 billion address spaces. In figure 13.1 [4], it depicts that IPv4 can only accommodate 4 billion of users where the current population of the world is around 7 billion and it is increasing linearly.

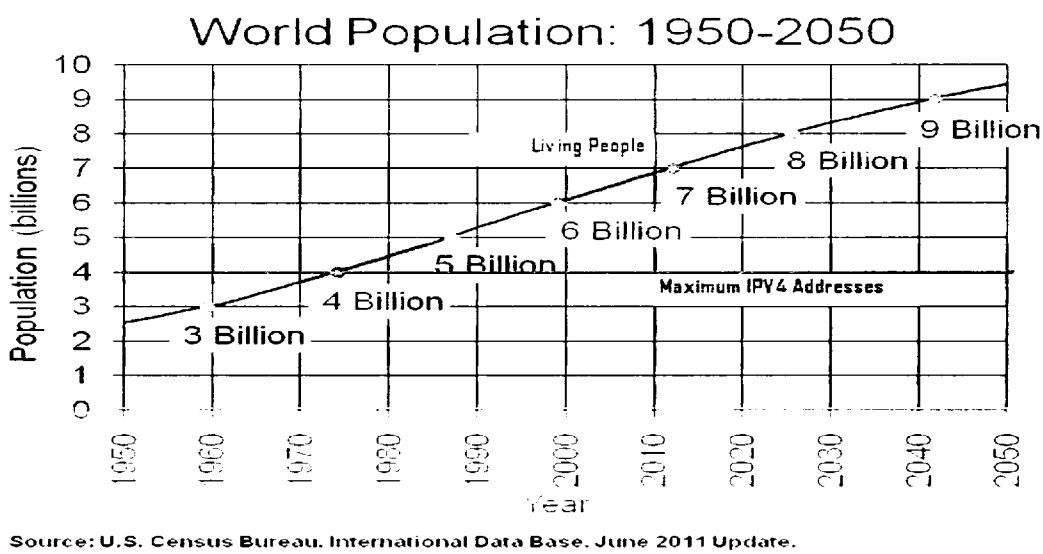

Figure 13.1: The projected world population and IPv4 addresses [4]

It is reported in [5] that, the IPv4 address is currently at an exhausted point and will be run out in 2012. Therefore, the need for more address spaces become important and the initiative has started in 199x [6] with a new version called IPv6. The address length of IPv6 is 128 bits (2^{128}) that is around 3.4×10^{38}. IPv6 has tremendous facilities including more address spaces, mobility (MIPv6), better QoS, improved security, plug and play etc. The deployment of IPv6 around the world is in progress in some developed countries. In this chapter we discuss the opportunities and deployment challenges of the MIPv6 in details.