

# Chapter 1

## Introduction to Wireless Networks

**M. A. Matin**

*Institut Teknologi Brunei, Brunei Darussalam*

### **ABSTRACT**

*Wireless networks offer mobility and elimination of unsightly cables and utilize radio waves or microwaves to maintain communication. It is rapidly growing in popularity for both home and business networking. Wireless technology keeps on improving and at the same time the cost of wireless products are continuously decreasing. The demand for ubiquitous personal communications is driving the development of wireless networks that can accommodate mobile voice and data users who move throughout buildings, cities, or countries. The objective of this chapter is to provide the fundamentals of wireless networks so that the general readers can be able to easily grasp some of the ideas in this area.*

### **INTRODUCTION**

Wireless networks have been a crucial part of communication in the last few decades and a truly revolutionary paradigm shift, enabling multimedia communications between people and devices from any location (Figure 1). It brings fundamental changes to data networking, telecommunication, and is making integrated networks. It has made the network portable because of digital modulation, adaptive modulation, information compression, wireless access and multiplexing. It supports ex-

citing applications such as sensor networks, smart homes, telemedicine, and automated highways. Early users of wireless technology primarily have been the military, emergency services, and law enforcement organizations. As the society moves toward information centricity, the need to have information accessible at anytime and anywhere takes on a new dimension. With the rapid growth of mobile telephony and networks, the vision of a mobile information society (introduced by Nokia) is slowly becoming a reality. It is common to see people communicating via their mobile phones and devices. With today's networks and coverage, it

DOI: 10.4018/978-1-4666-1797-1.ch001

is possible for a user to have connectivity almost anywhere. The growth in commercial wireless networks occurred primarily in the late 1980s and 1990s. The huge competition in the wireless industry and the mass acceptance of wireless devices have caused costs associated with the terminals and air time to come down significantly in the last 10 years.

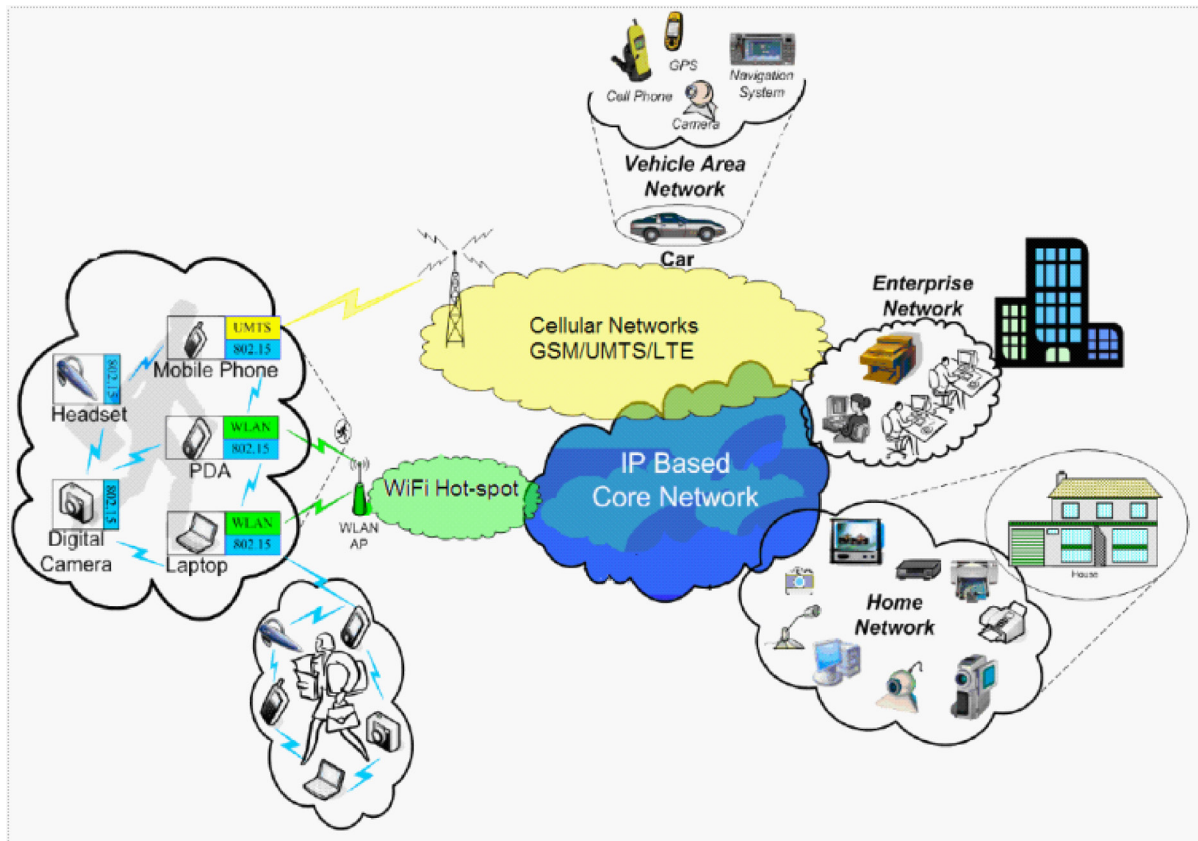
sibilities for connecting buildings which are up to several kilometres apart. It offers consistent and effectual keys to a number of instant applications therefore at present it is used under numerous diverse platforms such as health care, education, finance, hospitality, airport, and retail. The usage of wireless network increases day by day, because it has significant impact on the world. Therefore its uses have appreciably grown-up. The benefits of wireless networks are summarized as below:

## BENEFITS OF WIRELESS NETWORKS

Wireless networking is potentially a quick, easy and economical alternative that works between nodes and is executed without the use of wires around our home or office. It also opens up pos-

- User can move about and get access to the wireless network while working at an outdoor location.
- User can send information over the world using satellites and other signals through wireless networks.

Figure 1. Typical networking scenario of a person with various personal devices (Source: WiMedia, Ecma International 2010)



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