Advances in Mobility Management for IP Networks

Editors:
Aisha Hassan Abdalla Hashim
Othman Khalifa
Shihab A. Hameed

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EMAIL: iiumprinting@yahoo.com

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INTRODUCTION TO QOS APPROACHES IN MOBILE AD HOC NETWORKS

MOHAMMAD QABAJEH[1], AISHA-HASSAN A. HASHIM[2], OTHMAN KHALIFA[3], LIANA QABAJEH[4], AKRAM M. ZEKI[5]

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

m_qabajeh@yahoo.com[1], aisha@iium.edu.my[2], Khalifa@iium.edu.my[3], liana_tamimi@ppu.edu[4], akram@iium.edu.my[5]

30.1 OVERVIEW

This part of the book is an expository analysis of the QoS approaches in mobile ad hoc networks. Firstly, the pertinent QoS approaches in mobile ad hoc networks are introduced together with an investigative analysis of routing protocols for ad hoc wireless networks. In addition to this, the reader is gradually introduced into the cogent Quality of Service (QoS) issues in mobile ad hoc networks in order to show the significant research directions for further advanced study.The issues of supporting QoS multicast routing and position-based routing protocols for mobile ad hoc networks are systematically treated in by the authors. This book part concludes with an explication of the evaluation criteria of position-based routing protocols.

Wireless networking is an emerging technology that allows users to access information and services electronically, regardless of their geographic positions. The use of wireless communication between mobile users has become increasingly popular due to the recent performance advancements in computer and wireless technologies. Additionally, the lower prices, the higher data rates and the availability of mobile and handheld computing devices made a conceptual shift in mobile computing and introduced a lot of applications that can work anywhere and anytime. Generally, there are two distinct approaches to enable wireless mobile nodes to communicate with each other, fixed and mobile [1].

Fixed wireless networks do not support mobility and are mostly point-to-point (e.g., microwave networks, geostationary satellite networks). On the other hand, there are two variations of wireless mobile communication. The first one is known as infrastructure wireless network, and the second one is infrastructureless wireless network which is known as mobile Ad hoc network.

The infrastructure-based wireless network is a network with fixed base station and wired gateways. This type of networks consists of several base stations and mobile nodes, as shown in Fig. 1. The mobile devices use single-hop wireless radio communication to access a base station, and each mobile device is associated with only one base station. The base station is responsible for packets transmission, bandwidth management and mobile nodes controlling. As a mobile device travels out of range of one base station and enters into the range of another, a handoff occurs from the old base station to the new so that the mobile device is able to continue communication seamlessly throughout the network. An example of this type of networks is the cellular systems. This kind of networks is limited to places where there exist such network infrastructures. But this infrastructure may take long time to be deployed, which is not suitable in some situations such as natural disaster.