

QoS AND MOBILE TECHNOLOGIES

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CHAPTER 27

THE APPLICATION OF SENSOR NETWORK AND ROUTING PROTOCOLS IN WIRELESS COMMUNICATION

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27.1 INTRODUCTION

Wireless sensor network (WSN) is the collection of homogenous, self-organized nodes called sensor nodes. These nodes have the capabilities of sensing, processing and communication of data with each other wirelessly using radio frequency channel. The basic task of sensor networks is to sense the events, collect data and send it to their requested destination. Many of the features of these networks make them different from the traditional wired and wireless distributed systems. Traditional wired or wireless networks have enough resources like unlimited power, memory, fixed network topologies, enough communication range and computational capabilities. These features make the traditional networks able to meet the communication demands [1, 12]. On the other hand, WSNs are resource constrained distributed systems with low energy, low bandwidth and short communication range. The basic features which make WSNs different from the traditional networks are; self-organizing capabilities, short range communication, multi-hop routing, dense deployment, limitation in energy and memory, and also frequently changing topology due to fading and failures. [13, 12] The constrained resource nature and unpredictable network structure (sensor nodes are scattered densely in an environment) poses numerous design and communication challenges for WSNs. According to [8] “The challenges in the hierarchy of: detecting the relevant quantities, monitoring and collecting the data, assessing and evaluating the information, formulating meaningful user displays, and performing decision-making and alarm functions are enormous.” Generally, the wireless sensor network operation involve data acquisition and data reporting therefore it has a data acquisition network and data distribution network and a management center responsible for its monitoring and control as shown in Fig 27.1 below.