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ROUTING PROTOCOL OPERATIONS IN WIRELESS SENSOR NETWORKS – AN OVERVIEW

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Abstract

A wireless sensor network is a large collection of sensor nodes with limited power supply and constrained computational capability. Due to the restricted communication range and high density of sensor nodes, packet forwarding in sensor networks is usually performed through multi-hop data transmission. Therefore, routing in wireless sensor networks has been considered an important field of research over the past decade. In this paper, we present a survey of the state-of-the-art routing techniques in WSNs. Nowadays, multipath routing and QoS based routing approach is widely used in wireless sensor networks to improve network performance through efficient utilization of available network resources. Accordingly, the main aim of this survey is to present the concept of the multipath routing approach and its fundamental challenges, as well as the basic motivations for utilizing this technique in wireless sensor networks.

Keywords: *wireless sensor networks; multipath routing; concurrent multipath routing; alternative path routing; load distribution; energy efficiency; reliability; QoS.*

Introduction

Recent advances in wireless communication technologies and the manufacture of inexpensive Wireless devices have led to the introduction of low-power wireless sensor networks. Due to their ease of deployment and the multi-functionality of the sensor nodes, wireless sensor networks have been utilized for a variety of applications such as healthcare, target tracking, and environment monitoring. The main responsibility of the sensor nodes in each application is to sense the target area and transmit their collected information to the sink node for further operations. Resource limitations of the sensor nodes and unreliability of low-power wireless links, in combination with various performance demands of different applications impose many challenges in designing efficient communication protocols for wireless sensor networks meanwhile, designing suitable routing protocols to