

Unequal Cost Multi-path Forwarding for the WSN Load Balancing

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ABSTRACT

The energy based routing protocols are the most appropriate routing techniques for the maximum lifetime of the sensor networks during their applications. In this research, we have proposed the new energy based routing protocol with energy aware routing and load balancing. The proposed model is intended to improve the efficiency of the proposed model. The proposed model has been designed with the multiple metric based tree-routing. The proposed tree-based routing protocol utilizes the residual energy, distance, hop-count, bandwidth and neighbor node id for the purpose of the metric calculation for every available route. The load balancing is enabled between the two or more than two available paths between the target node and base station. The proposed model offers the load balancing between two unequal cost paths with unequal load division for the purpose of efficient data delivery. The proposed model results have been obtained upon the various performance parameters of network load, transmission delay, throughput, energy consumption and route persistence. The experimental results have proved to be efficient and better in comparison with the existing models. The proposed model has been proved to be efficient on the basis of almost all of the given performance parameters.

Keywords: Tree-based routing, WSN routing, Energy efficient routing, Multi-path Routing.

1. INTRODUCTION

Over the last half a century, computers have exponentially increased in processing power and at the same time decreased in both size and price. These rapid advancements led to a very fast market in which computers would participate in more and more of our society's daily activities. In recent years, one such revolution has been taking place, where computers are becoming so small and so cheap, that single-purpose computers with embedded sensors are almost practical from both economical and theoretical points of view. Wireless sensor networks are beginning to become a

reality, and therefore some of the long overlooked limitations have become an important area of research [1, 3, 4, 5].

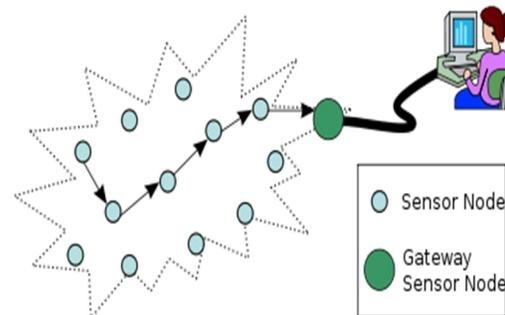


Fig. 1. Wireless Sensor Network Architecture

Today in the market of rapid growth of computers the processing power are increased unexpectedly but the price and size of computers have greatly reduced which encourages the use of computers very much. The latest technologies have made vast advancements in computers era and also enhance the use of computers in our daily activities. In recent years, from the economic point of view, the single-purpose desktop computers having sensors embedded in them are highly used due to cheapness in prices and reduction in size of computers.

Wireless Sensor Networks have been receiving a great amount of attention recently due to their substantial applicability to improve our lives. They aid us by extending our ability to accurately monitor, study, and control objects and environments of various scales and conditions such as human bodies, geological surveys, habitats, and security surveillance. Large no. of sensor nodes in a field connected with a sink node to transmit information about events to satellite associated is shown in Figure 1.

In this paper, we have worked upon the new routing protocol based upon the tree-based topology for the load