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Drifting Approach for Energy Consumption in Wireless- Sensor Networks

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Abstract

The growing technologies and several issues concerned to the wireless sensor networks keeps the remarkable change in the existing technologies of wireless sensor networks and most of the concerned issues are related to the consumption of power and crucial part of the networks are mainly deal with properties like sensing, computing, and radio but this paper mainly concerned about the a novel sleep scheduling technique and virtual backbone Scheduling where traffic is only forwarded by backbone sensor nodes, and the rest of the sensor nodes turn off their radios to save energy. In this paper, the main focusing is concerned with two approaches in which first one is deal with rotation of multiple backbones which can makes sure that the energy consumption of all sensor nodes is balanced and fully utilized inside the network and second approach is the efficient routing with minimum energy consumption of nodes where each node in the network is equipped with a learning automaton to collectively learn the path of aggregation with minimum consumption energy for each node in the network where one can achieve the remarkable drift in energy consumption at very minute level of the network.

Keywords: Remarkable, Sensing, Rotation, Automaton, Drift

1. INTRODUCTION

In real time applications of the wireless sensor network it is necessary for the nodes to achieve two things the first one is Quality of Service as well as fault tolerance for the sensing In this concept, we are dealing with the novel sleep-scheduling technique called Virtual Backbone Scheduling[1]. Where actually VBS is designed for WSNs with redundant nodes, where VBS forms multiple overlapped backbones which work alternatively to prolong the network lifetime. As concerned to this approach traffic is only forwarded by backbone sensor nodes, and the rest of the sensor nodes turn off their radios to save energy. And the second approach is mainly concerned with efficient routing with minimum energy consumption of nodes where each node in the network is equipped with a learning automaton to collectively learn the path of aggregation with minimum consumption energy for each node in the network [2]. This concept is an adaptive decision-making unit situated in a random environment of the wireless sensor network that learns the optimal action through repeated interactions with its environment. The concept of automaton reads an input from its environment existing paths to forward the traffic and then it updates n (t) to n (t+1) after choosing a successor state according to the probabilities and outputs the corresponding to the particular action. Further the automaton's environment, in turn, reads the action and sends the next input to the automaton.

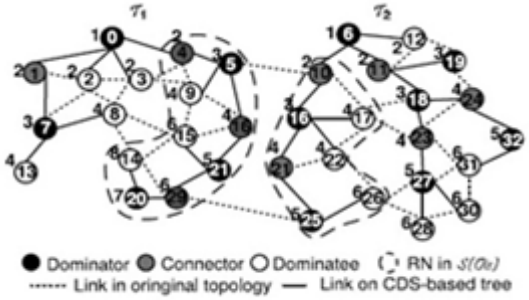

Figure 1: Link Stability in MANET

The rotation of multiple backbones in the entire approach which will make sure that the energy consumption of all sensor nodes is balanced and fully utilizes the energy and achieves a longer network lifetime compared to the existing techniques.

Energy efficiency is one of the primary concerns for wireless sensor networks. As concerned to the Prolonging networks lifetime in terms of saving the energy and the system design also completely based on scheduling sensor activities so that a subset of active sensors, instead of all the sensors, can carry out a task while the rest of the redundant sensors can go to the sleep mode for energy conservation.

2. Related Work for Design Issues

A survey on various power saving techniques for multi-hop wireless networks on sleep scheduling can be divided into two different types of scheduling such as synchronous and asynchronous scheduling [3]. It is also concerned that minimum end-to-end delay, sleep scheduling, energy-delay, trade-off in tree shaped Wireless Sensor Networks and also are summarized thoroughly, and a various scheduling algorithms proposed are concerned to reduce the forward and backward delays in data gathering WSNs. By considering static Networks in the trees the sensors in the network are randomly placed in network and there is only one sink, which is always working and has an infinite power supply. Basically links between sensors are undirected and the VBS scheduling system works with duty-cycling. Where each cycle is represented by T and it should be greater than 1 for the continuous cycles to complete a round and also by concerning the all issues as well as approaches of K-MLBS [3] problem solving technique the sink is to be placed at the centre of the area and all nodes have the same transmission range. And the number of nodes is varied to model different network densities and scale.

A node's lifetime is the time span from when it starts working to when its energy is depleted. Network lifetime is the minimum lifetime of all the sensors in the network when it completes its schedule early and a schedule in VBS is a set of backbones that working sequentially. It is represented by a set the working time of backbone Network the goal is to find a schedule with maximum network lifetime further to increase network lifetime, energy waste in half-optimal utilization of resources is prevented.

This is done via energy conservation technique in network unit. The usage of an optimal route for data transmission from sensor node is to the sink node to be selected by knowing the network topology and each moment they select a route that is optimal in terms of energy [4]. In either technique only energy parameter was used alone or delay parameter was considered. If energy parameter alone is used it is possible that an unacceptable delay occurs and if delay parameter alone is taken into account but the learning automaton concept selects the best modes from among all modes using learning automaton.

Basically the automata in the sensors will typically compute and maintain a set of probabilities, which will determine the selection of the best possible neighbour during the packet forwarding process. As mentioned above, the automata present in our WSN will consider two metrics while computing these probabilities the first thing is energy levels and second one is the number of hops to reach the station and these metrics with their role in the computation of the probabilities will play a crucial role in the path aggregation with minimum consumption energy for each node in the network where one can achieve the remarkable drift in energy consumption at very minute level of the network.

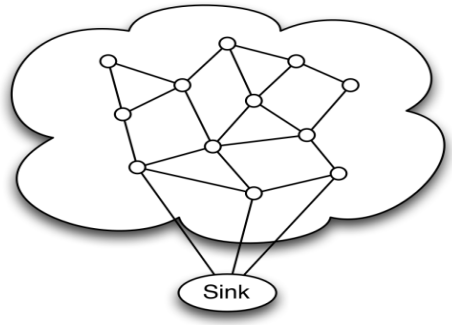

Figure 2: Path Aggregation in MANET

3. Automan Concept for Drift in Energy

Inside Automan concept to identify and discover the neighbour nodes among available paths of the network is mainly concerned with a node "N" receives a message for the first time from another next node "K", then this message produces a new entry in its Neighbour List note that the neighbour "K" could perfectly be the sink S if node N is within the radio reach of S.

Each message carries back the data that is needed to populate and to update the fields in the Neighbour List. And the neighbour list provides a straightforward mechanism to prevent forwarding loops in the sensor network. When node N receives the message, it swaps node K's energy with its own energy level and also appends its own ID to the list of hops before forwarding the message to its neighbour. When a sensor N receives a packet, the routing process is invoked, and the Learning Automaton selects the ID of the next-hop, based on the probability set stored in the Neighbour List. Due to its effectiveness and simplicity a compound metric concept is used and Compound Metric (CM) module selects in parallel the next-hop[4], which we denote as ID(CM) that a Decision Maker module selects the next-hop that will be finally used.
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4. Conclusion

Here from these approaches I need to conclude that the first approached technique deals with rotation of multiple backbones and which can makes sure that the energy consumption of all sensor nodes is balanced and fully utilized inside the network and another approach is the efficient routing with minimum energy consumption of nodes where each node in the network is equipped with a learning automaton to collectively learn the path of aggregation with minimum consumption energy for each node in the network where one can achieve the remarkable drift in energy consumption at very minute level of the network and it which is going to be a remarkable drift of energy consumption in the field of wireless sensor networks

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