

Survey on Region Based M-GEAR Protocol in Wireless Sensor Network

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Abstract— The region based energy efficient technique for the data communication among nodes in a wireless sensor network is a best approach to enhance the network life time of a network. The rechargeable node called gateway node placed at the centre of the two region helps to minimize the energy consumption of Cluster heads in respective regions. This paper presents the survey of gateway based energy efficient technique and the communication among region nodes with base station using positive coordinates of the region following the base station.

Keywords:- WSN, gateway node, life time, network region, cluster heads.

I. INTRODUCTION

The increased usage of wireless sensor network in different application, leads the increasing of problem characteristic in such applications. Wireless sensor network consists set of tiny devices called sensors used for data communication. The sensed data are transmitted to the sink or base station for further processing according to application. The main concern during the communication is the limited energy of the nodes and the data conjunction. Many network clustering protocols are developed to overcome this problem, but the battery life is again the key concern. The implementation of rechargeable node among the nodes called gateway node helps to increase the lifetime of the network and the region based distribution of nodes in the network coordinates helps to reduce data conjunction. The purpose of this paper is to present the overall study of wireless sensor network based on gateway node. The paper given the brief study of PEGASIS protocol.

II. RELATED WORK

[1] This paper presents the multilevel multi-hop gateway based energy based technique. The network area is divided into four different regions, region 1 consists of nodes near to sink, region 2 & region 3 is cluster region away from sink and region 4 is a cluster region near to gateway node. Each node in the network have a distinctive identifier, the network model works in phases, development phase and setup phase, in setup the division of regions are done. In region 1 near to sink, nodes send data direct to sink and in region 2 & 3 nodes

send data to cluster heads and further to gateway node. This helps for enhancing network life time.

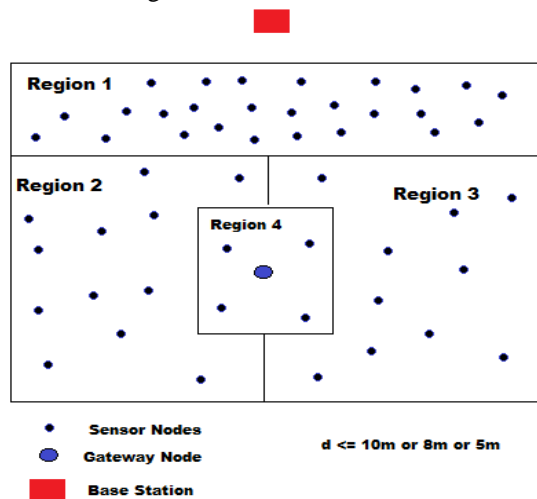


Figure 1. Network Layout Model[1]

[2] This paper presents an new a gateway based routing protocol name GEER protocol. The paper model works on sectors based on the distance of nodes from base station. if $Nd_{toBS} < d_0$ called Sector 1, if $Nd_{toGS} < d_0$ called Sector 2, if $Nd_{toBS} > d_0$ & $y_n > y_{BS}$ called Sector 3 and if $Nd_{toGS} > d_0$ & $y_n \leq y_{GS}$ called Sector 4. The performance of the network is calculated using parameters, alive nodes, network lifetime, average energy and dead nodes. In sector 1 the nodes communication dirt with the sink.

The model depends upon the first order radio model as shown in figure 2. The transmitter and receiver used in this

model use the same kind of electronic circuitry and thus their energies are accumulated by E_{elec} , during each data bit transmitted.

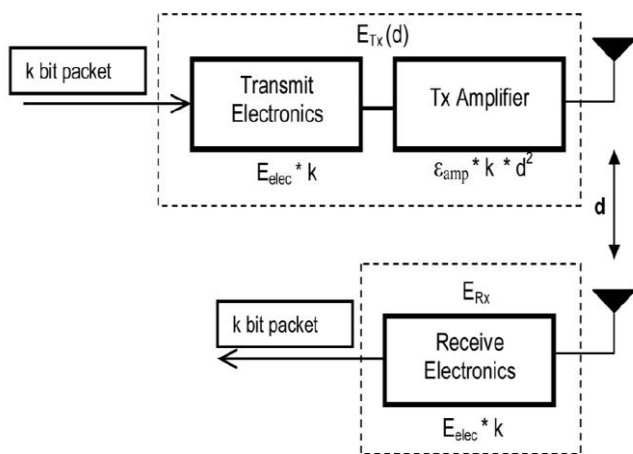


Figure 2: First order Radio model [2]

[3] This paper divides the sensor nodes into four logical regions on the basis of distance from the Sink installed out of the sensing area and a rechargeable node called gateway node which is placed at the centre of the sensing area. If the distance of a sensor node from BS or gateway is less than predefined distance threshold, then such node communicates direct with the base station otherwise it divide the rest of nodes into two equal regions whose distance is beyond the threshold distance as shown in figure 1. The paper works in phases, Initial Phase called deployment of node randomly in homogeneous network area. Setup Phase called network division phase, CH Selection phase based on probability and Scheduling according to time slot created by TDMA.

The working model evaluates three performance parameters :

Throughput: Which defines the number of packets delivered at the base station.

Lifetime: it is the time from the start of the network to the last node dies.

Residual Energy: It is the energy consumption of the nodes during each round.

This techniques the radio energy dissipation model to implement their work and divides the network into regions.

[4] This paper presents a model based on energy dissipation model to analyze data delivery. The paper presents hexagonal grid deployment strategy for deployment of the nodes, and a mobile sink. This paper show some better enhancement over the life time of network compared with square are and grid area network using radio energy dissipation model as shown in figure 3.

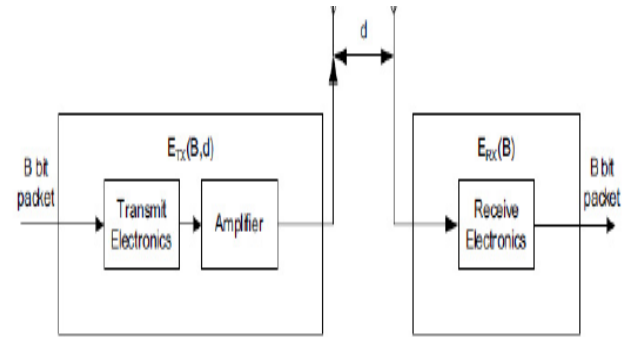


Figure 3. Radio energy dissipation model [3]

The model is based on the energy for transmitting and receiving messages defined by E_{TX} and E_{RX} .

[5] This paper discussed the gateway based concept in SEP protocol by placing number of gateway nodes at the edge of the network with some advance nodes within the area. The sink is placed out of the sensing area as other techniques did. The selection of the normal or advance node depends upon the probability factor value called P_{adv} .

[6] This paper gives the brief study of WSN MAC design and the scheduling technique for data transfer. This paper helps in understanding the factor influencing the WSN life time such as throughput, channel utilization, fairness, energy efficiency, latency etc. It also gives the brief study of TDMA for time duration of communication into fixed time slots.

[7] This paper briefs PEGASIS Protocol, which is working in a chain structure and every chain have only one cluster head, this chain send data to other nodes which are nearer to that node closest to positive axis of the network. This increases the efficiency of the network by minimizing energy consumption.

III. CONCLUSION

From the study, the region based network division needs some improvement during the communication in region 1 where the nodes sends collected data directly to the sink without considering the distance from the sink. It may be possible to accomplish some further improvement in region one without losing the path and energy of the nodes, this can be done by implementing PEGASIS Protocol in this region. This will help to minimize the energy consumption and pathloss.

ACKNOWLEDGMENT

The above paper content I have mentioned are studies form different papers and the contents are true to my knowledge.

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Authors Profile

Ms. Amandeep Kaur is pursuing M Tech in computer science from Punjab Technical University. She is working on Wireless sensor networks and her main focus is to impliment her work to improve the Lifetime of network using improved MGEAR Technique.



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