RESEARCH ARTICLE OPEN ACCESS

Designing an Optimal Data Delivery Strategy at Base Station in Mobility Nets

Nirjary Gummadi [1], Gayatri Veguru [2], Jahnavi Yeturu [3]
Department of Computer Science and Engineering
PG Scholar [1], Associate Professor [2], Professor [3]
GIST, Nellore
AP - India

ABSTRACT

The protocol is reliable when it comes to data delivery in the base station (BS). We consider mobility in sensor nodes as well as in the BS. The suggested protocol is hierarchical and cluster based. Each cluster includes one cluster mind (CH) node, two deputy CH nodes, and a few ordinary sensor nodes. Wireless sensor systems (WSNs) are resource restricted. Energy is among the most significant sources such systems. Therefore, optimal utilization of energy is essential. Within this paper, we present a manuscript energy-efficient routing protocol for WSNs. The re clustering time and effort needs happen to be minimized by presenting the idea of CH panel. In the initial stage from the protocol, the BS chooses some probable CH nodes and forms the CH panel. Thinking about the reliability part of the protocol, it puts best effort to make sure a particular throughput level in the BS. With respect to the topology from the network, the information transmission in the CH node towards the BS is transported out either directly or perhaps in multi hop fashion. Rigorous simulation results illustrate the power efficiency, throughput, and prolonged duration of the nodes drunk from the suggested protocol. Future scope of the jobs is outlined. Furthermore, alternate pathways can be used for data transmission from a CH node and also the BS.

Keywords:- Energy efficiency, mobile base station (BS), mobile nodes, reliability, routing protocol, wireless sensor networks

I. INTRODUCTION

With respect to the application type, the BS is situated either not even close to the sensor field or inside the sensor field. Such systems have number of programs in military and civil domain names. Some application regions of WSN are listed below: combat field surveillance, target monitoring in battlefields, invasion recognition, post disaster save procedures, wise home, monitoring and alarming systems for supermarkets, wildlife monitoring systems, and lots of security and safety related programs [1]. Within the aforementioned programs, the sensor nodes generate physical data in the atmosphere of great interest. Wireless Sensor Network (WSN) includes several resource-restricted sensor nodes at random deployed on the geographic region. These sensor nodes forward physical data toward a ingenious base station (BS). The thought data are finally submitted toward the BS for more processing and making decisions regarding the control for meeting the objectives from the system in position. With respect to the application type, the sensor nodes and also the BS could be static or mobile. Inside a typical WSN, the sensor nodes are highly resource restricted. The sensor nodes are affordable, disposable, and likely to last until their energy drains out. Therefore, energy is an extremely limited source of a WSN system, and it must be handled within an optimal fashion. Reliable and effective data delivery in the BS is preferred. Energy-efficiency is a vital facet of any use of WSN. Routing of information in WSN is really a critical task, and tremendous amount of one's could be saved if routing could be transported out tactfully. Hierarchical routing is regarded as a power-efficient and scalable approach. Routing inside a WSN setup by which both sensor nodes and also the BS are mobile is really a challenging problem. Therefore, the routing protocol needs to take proper care of the connectivity issue also in this WSN setup. Data packets should be routed using this connectivity issue into account. Otherwise, you will see significant data loss packets

because of unsuccessful links aside from other reasons for example frequent dying of sensor nodes or noise from the wireless links. Within this paper, a manuscript routing protocol, that is known as Energy-Efficient and Reliable Routing protocol for mobile wireless sensor network (E2R2), is suggested. The suggested protocol is really a hierarchical one. Our major goal would be to achieve energy-efficiency and also to provide connectivity towards the nodes. The mobility from the nodes is recognized as while routing choices are created. The aim behind such routing would be that the data packets have to undertake appropriate routes regardless of node mobility as well as in existence of subsequent link failures [2].

II. DESIGN OF SYSTEM

Within the system in mind, the assumption is the sensor nodes are similar in hardware, software, and abilities. Initially, all of the sensor nodes have equal quantity of energy. As time passes of operation, nodes may have unequal levels of energy. The sensor nodes and also the BS are mobile with medium mobility level. A medium mobility level signifies a speed selection of the sensor nodes and also the BS that is neither high nor really low. During the time of implementation, the number might be specified quantitatively. The assumption is the sensor nodes know their mobility level. We consider three different mobility levels, i.e., high, medium, and occasional. The BS is extremely reliable and ingenious. After deployment from the sensor nodes within the field, the area is realistically partitioned into some groups. The BS forms these groups by performing some appropriate clustering formula [3]. Each cluster consists of one CH node and 2 supporting DCH nodes. DCH nodes will also be known as cluster management node. The main objective of the work would be to design a power-efficient and reliable routing protocol for any mobile WSN that works within an unwatched manner and, sometimes, in hostile atmosphere. Because the sensor nodes are resource restricted (particularly limited energy and limited onboard storage capacity), the routing protocol should consume low power and cannot burden the nodes with storage overhead.

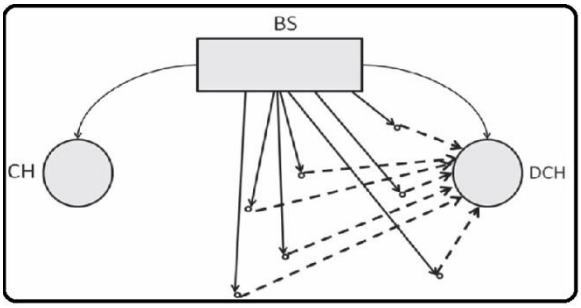

Fig.1. Proposed system

III. PROPOSED FRAMEWORK

Here, we advise a manuscript plan for routing inside a mobile WSN by which both sensor nodes and also the BS are mobile. The suggested protocol that is known as E2R2 accomplishes fault tolerance by providing some alternate routes to forward data in existence of any fault within the existing route. The primary objective would be to extend the duration of the sensor nodes within the network. The protocol offers some appropriate alternate routes for packet forwarding in existence of node or link failure in the present route. This arrangement doesn't permit the throughput level in the BS, when it comes to packet delivery, to degrade drastically. The protocol takes proper care of the power efficiency and also the longevity of the routes. The information packets are routed through multiple hops to be able to minimize the transmission energy needs in the sender nodes. Following the deployment from the sensor nodes, the BS produces categories of different sensor nodes to be able to form groups. Each cluster consists of a CH node and 2 DCH nodes. The BS chooses some appropriate sensor nodes from each cluster, which could behave as CH or DCH in a later stage [4]. The CH nodes perform the data aggregation to get rid of redundancy after which forward the aggregated data toward the BS. The DCH nodes do several cluster management tasks which include mobility monitoring also. The communication pattern or even the route for that CH nodes is dependent upon the BS and given to the particular CH nodes. Therefore, the BS continues monitoring the particular amount of data showed up from various groups within the network. The CH views this as feedback in the BS and accordingly inspections the present connectivity using its cluster people. When the connectivity status from the cluster people using the particular CH is extremely poor, the BS decides to shift the control of

cluster headship to a different appropriate member from inside the CH panel. With respect to the connectivity scenario, the cluster headship might be moved to among the two DCH nodes also. The routing choices are created in the BS after which conveyed towards the sensor nodes. Therefore, this protocol exploits the ingenuity from the BS by shifting routing and a few cluster management activities towards the BS. After random deployment from the sensor nodes within the sensor field, the self-organization phase starts. It's the first phase from the protocol. The CH node accounts for gathering thought data in the cluster people, aggregate individuals, and forward toward the BS either directly or perhaps in a multihop fashion. This part of data forwarding will occur based on the communication pattern or even the route written by the BS. The DCH nodes keep monitoring the sensor nodes' mobility pattern. DCH nodes will also be known as cluster management nodes because they have a major responsibility of collecting current location information in the cluster people and interacting it towards the BS. Because the location information of each one of the CH nodes can be obtained using the BS, the BS computes different alternate multi hop routes for each one of the CH node. These routes are calculated thinking about the CH nodes only that is spread all through the sensor network. The sensor nodes could be either in of these two states active and dormant. Some sensor nodes are scheduled for dormant condition that is a low-power condition. The sensor nodes forward data toward the CH node based on their particular medium access time slots. The CH nodes take away the redundancies within the data sent through the sensor nodes by the entire process of data aggregation and lastly forward the aggregated data toward the BS as reported by the communication pattern written by the BS. Because of the node mobility and also the sudden dying of some sensor nodes, the CH node may lose enough links using its cluster people. This might considerably degrade the throughput level when it comes to packet delivery in the BS. Under this case, the BS may send feedback towards the CH, and also the CH then inspections the present connectivity using its cluster people. Here, we produce an analytical model that may be modified to obtain the possibility of a route being valid. Because the nodes are mobile, the hyperlinks are vulnerable to break abruptly [5]. Therefore, a route that's available and therefore valid nowadays might not be available as time passes. The hyperlink availability addresses the problem of conjecture from the status of the outcomes of two mobile nodes following a specific period of time according to different network parameters.

IV. EXPERIMENTAL RESULT

We assess the performance of the suggested protocol with M-leach in terms of throughput and life period across different data rates. When number of nodes increments the power used is lesser in proposed system while compare with the existing system.fig4 displays suggested protocol performs better than M-leach and produces higher throughput from the number of nodes expanded in the area. Dropped packet is less in proposed system and the packet distribution rate is high for proposed system. The suggested protocol surpasses M-leach in terms of life period and throughput. The average transmission power increases along with the improvement in the space of network

Simulation Time	100ms
Size of data packets	512 bytes/sec
Field Dimension	1000m x 1000m
Initial energy	200 J
CBR Interval	4 packets/sec

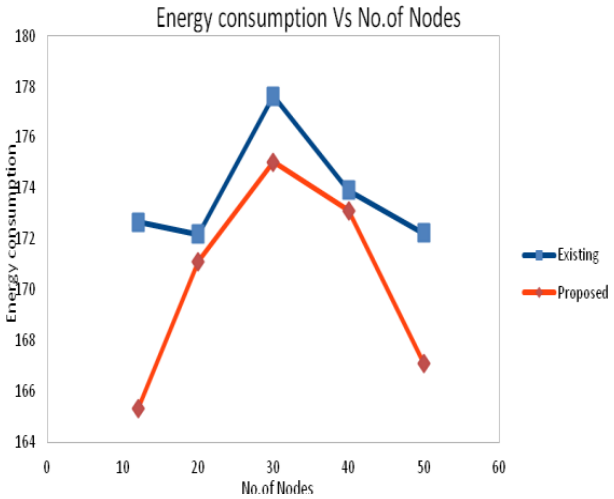

Fig: 2 Energy consumption Vs no of nodes

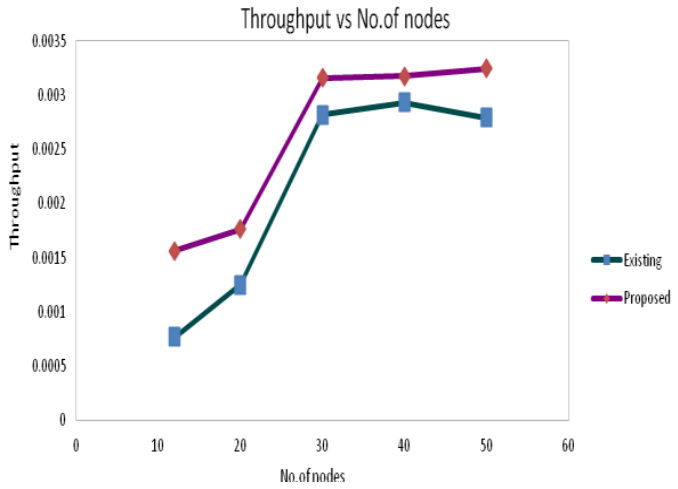

Fig: 3 Throughput Vs no of nodes

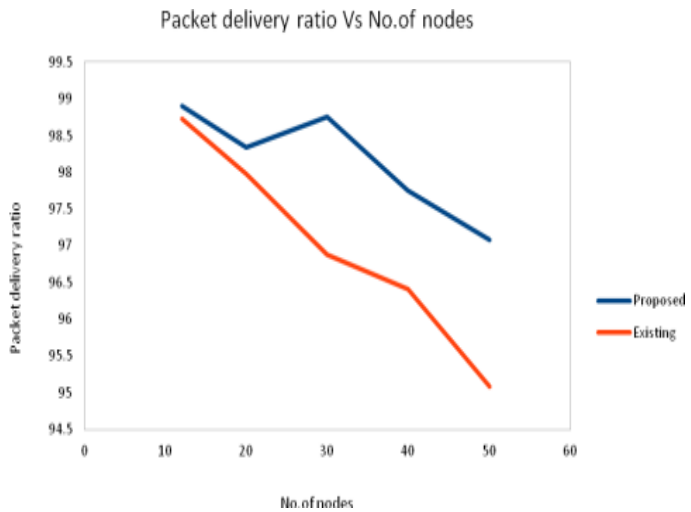

Fig: 4 Packet delivery vs no of nodes

V. CONCLUSION

The suggested protocol E2R2 is hierarchical and cluster based. Each cluster consists of one CH node, and also the CH node is aided by two DCH nodes, that are also known as cluster management nodes. Within this paper, we've suggested a power-efficient and reliable routing protocol for mobile WSNs. We evaluate the performance from the suggested protocol through simulations and match up against M-LEACH. The suggested protocol outperforms M-LEACH when it comes to lifetime and throughput, within the suggested protocol, the throughput improvement typically over M-LEACH. This type of routing protocol is helpful once the sensor nodes and also the BS are mobile. The suggested protocol can as well be examined drunk of highly mobile sensor nodes. The work could be extended to enhance the throughput even just in our prime-data-rate situation, in which the sensor nodes generate data at an excellent constant rate.

REFERENCES

[1] T. Camp, J. Boleng, and V. Davies, "A survey of mobility models for ad hoc network research," Wireless Commun. Mobile Comput., vol. 2, no. 5, pp. 483–502, Aug. 2002.

[2] K. Akkaya and M. Younis, "A survey on routing protocols for wireless sensor networks," Ad Hoc Netw. J., vol. 3, no. 3, pp. 325–349, Nov. 2005.

[3] S. Mao, and Y. Thomas Hou, "BeamStar: An Edge-Based Approach to Routing in Wireless Sensor Networks," IEEE Trans. Mobile Comput., vol. 6, no. 11, pp. 1284–1296, Nov. 2007.

[4] I.F.Akyildiz, W. Su, Y. Sankarasubramaniam, and E. Cayirci, "A survey on sensor networks," IEEE Commun. Mag., vol. 40, no. 8, pp. 102–114, Aug. 2002.

[5] F. Ingelrest, D. S. Ryl, and I. Stojmenovic, "Optimal transmission radius for energy efficient broadcasting protocols in ad hoc and sensor networks," IEEE Trans. Parallel Distrib. Syst., vol. 17, no. 6, pp. 536–547, Jun. 2006.

[6] W. Heinzelman, A. Chandrakasan, and H. Balakrishnan, "Energy-efficient Commun. Protocol for wireless microsensor networks," in *Proc. 33rd Annu. HICSS*, 2000, pp. 1–10.

[7] A. Manjeshwar and D. P. Agarwal, "APTEEN: A hybrid protocol for efficient routing and comprehensive information retrieval in wireless sensor networks," in *Proc. IPDPS*, 2002.