

An Energy Efficient Low Energy Adaptive Clustering Hierarchy Routing Protocol base on I-Node

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Abstract -- Wireless networks are quite important for wireless data transfer, which require an energy source. The wireless devices had limited energy as they operate on battery, which need replacement. This becomes the major bottleneck of wireless sensor devices. The replacement of batteries is quite costly, so the need of hour is to enhance the lifetime of the network. This will utilize the network energy in proper manner which reduce the overall global cost of the network. In this paper, an energy efficient routing is proposed based on I-Node which reduce energy consumption of the network.

I.INTRODUCTION

Wireless Sensor Networks (WSNs) is also familiar with the name of Wireless Sensor and Actuators Networks (WSANs). WSN technologies are largely used in distinguished types of areas like as military, industry, consumer applications and traffic observation.

1.1 Various LEACH Variants

Advanced-Low Energy Adaptive Clustering Hierarchy (LEACH-A) - LEACH protocol has a task that the CH point uses maximum power than regular points. Advanced-LEACH, an unlike procedure is applied over minimizing the chances for defeat of points as well as to expand peak intermission ahead the decline of initial point.

Every sensor understands about the beginning of everyone level through a synchronized clock.

Balanced-Low Energy Adaptive Clustering Hierarchy (LEACH-B)- Andrea D. et.al suggested a recent algorithm that is known as LEACH-B. This protocol is found on the basis of cluster creation of decentralized algorithm. In which a node have information regarding its own location and have information regarding the location of base station only and have nothing knowledge about the locality of some other nodes. LEACH-Balanced consists some phases that are: cluster creation, election algorithm of CH and communication of facts along multiple accesses.

Centralized Low Energy adaptive Clustering Hierarchy (LEACH-C) - Wendi Rabiner H. et.al introduced initial Centralized LEACH Protocol

(LEACH-C). Centralized-LEACH Protocol operates upon central control algorithm for clusters formation and be able to create superior clusters via distributing CH nodes in the system. The fundamental of LEACH-C is that a protocol that operates on centralized clustering rule as well as similar steady state protocol like LEACH. LEACH-C produces superior results via spreading the CH points within the

system. In the setup stage every point delivers information regarding own present location as well as the information regarding power scale over destination node. In every round the numbers of CHs are equal to the preset highest value but LEACH has nothing information regarding the current location of CHs. LEACH-C sends the bulk of data per unit area but LEACH sends the minimum amount of data. LEACH-C results energy proficiency.

Energy - Low Energy Adaptive Clustering Hierarchy (E-LEACH) - Within E-LEACH protocol the cluster head election procedure is advanced when this is compared with traditional LEACH protocol. Like as LEACH, the E-LEACH protocol is split up within distinct tracks. At the initial track each node would have equal possibility to become the CH for the cluster. After the completion of initial track all the nodes would attain distinct energy and according to this which node would have more energy that node would be elected as a CH for that cluster as well as remaining nodes related to that cluster to be the cluster members and would have lower energy. Writers convey similar conclusion for E-LEACH enhancement with respect to LEACH.

Fixed number of cluster Low Energy Adaptive Clustering Hierarchy (F-LEACH) - When system start up the idea of groups formation is stated, similar to the LEACH in this the location of CH interchanges between the nodes of the cluster. With respect to LEACH the merit of this procedure is: at the starting of every round no fixed high up like LEACH. F-LEACH optimizes centralized cluster creation rule which is similar to LEACH-C for the procedure of cluster creation. The demerit of this LEACH-F is: in the network if anyone node break down the confirmed clusters of LEACH-F never permit to be combined to unused nodes and never attained node's behavior in the network.

Improved Low Energy Adaptive Clustering Hierarchy (LEACH-I) - I-LEACH adopts the dispersed clustering manner with respect to LEACH. The network field is totally distributed into equivalent sub groups. Similar to LEACH protocol in I-LEACH protocol the election of CH in everyone sub group is discovered by using T(n) approach. I-

LEACH provides superior results in the form of energy as compared to LEACH.

II. LITERATURE REVIEW

B. Manzoor et al. had projected associate increased version of LEACH named as Q-LEACH [1]. In this paper author implement Quadrature-LEACH (Q-LEACH) for homogeneous networks that enhance stability amount, network life-time and turnout quiet significantly. during this paper author enhances the prevailing protocol specified a lot of strong and optimized results may be achieved. Q-LEACH, significantly improved network parameters and appears to be an attractive selection for WSNs by extending and enhancing overall network quality parameters.

Q. Nadeem et al. [2] presents Gateway-Based Energy-Aware Multi-Hop Routing Protocol for WSNs. during this paper, author divides the network into logical regions. every region use totally different communication hierarchy. 2 regions use direct communication topology and 2 regions square measure more sub-divided into clusters and use multi-hop communication hierarchy. every node in an exceedingly region elects itself as a CH independent of alternative region. this system encourages higher distribution of CHs within the network. Simulation results show that the projected protocol performs well compared to LEACH in terms of Network lifespan, Residual energy and turnout.

Salim Khediri et al. had projected a LEACH based mostly new bunch approach of routing [3]. during this paper, the energy efficient bunch formula for wireless sensors network has been introduced. elaborated simulations of wireless sensors network atmosphere demonstrate that authors approach could be a sensible candidate to extend the amount of stability of network, and has the power of extending the generation of the entire network. The author evaluated O-LEACH solely on static networks. This protocol ought to be tested on dynamic networks in addition.

Hu Junping et al. presents associate formula for Time-based Cluster-Head choice [5]. during this paper, author had given a completely unique approach to boost LEACH protocol, and compared it to the LEACH protocol. to create constant range of clusters, TB-LEACH constructs the cluster by victimisation associate formula based mostly random-timer, which does not want any international data. Simulation results show that the TB-LEACH provides the higher energy potency and also the longer network lifespan than the LEACH.

III. PROPOSED WORK

The TDMA is done by BS only. Thus in the results work load on BS increased. So in the purposed work intelligent node is used. The work load on the BS is minimized by using intelligent node (I-Node). For both TDMA and data aggregation intelligent node is used.

Table I: Values for network parameters used

Simulator Used	MATLAB-2013
Parameters	Standard Radio Model
Environment Size	User defined
Deployed sensor nodes	User Defined
Base station	1
Simulation round	0 to 10000
Referred protocol	LEACH
CHs	Probability based selection
Initial Energy	Standard
CSMA/CD	TDMA

I-Node have maximum energy. The price of insertion of I-Node is obtained by enhancing the performance and network lifetime.

CH selection in the base paper is done with only traditional way. In the purposed work we are used other factors the CH selection is on the basis of maximum energy, probability and distance. This is effective CH selection.

Sleep awake technique is also introduced in the purposed work. Using this technique a large amount of energy consumption is reduced and expands the network lifetime. Because when a node works then all of the remaining nodes are on the sleep until the activated node does not damage.

Using I-Node and sleep awake technique in the purposed work better data aggregation, enhanced network lifetime and energy utilization is achieved.

IV. RESULTS AND DISCUSSIONS

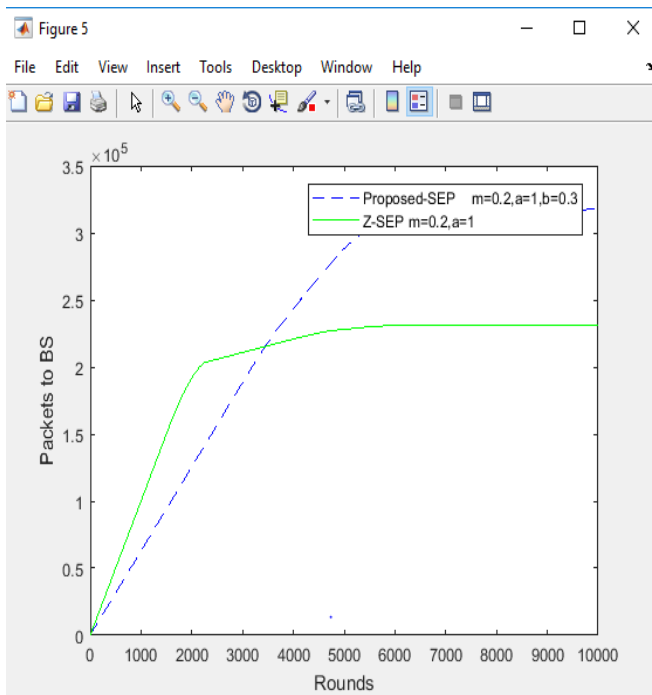


Fig. 4.1 Packets to Base Station

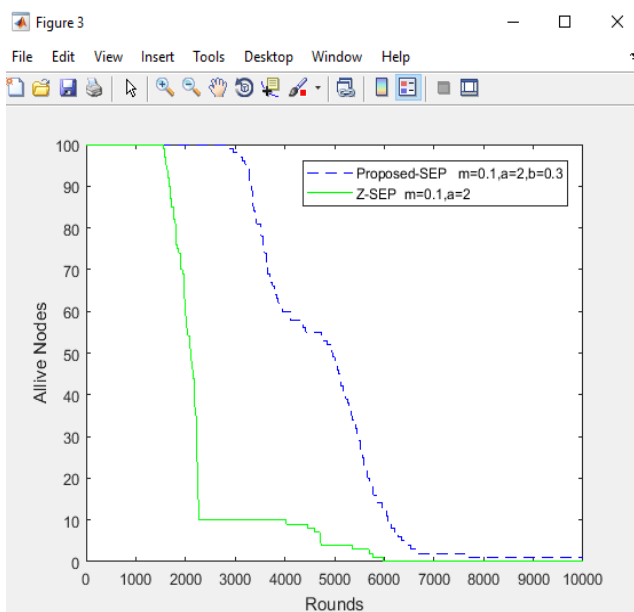


Fig. 4.2 Percentage of alive nodes in a sensor network

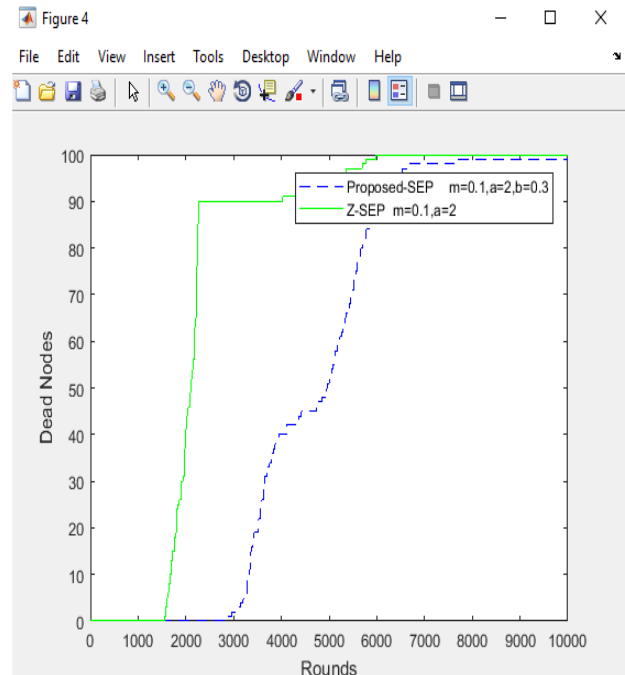


Fig. 4.3 Dead nodes of the sensor network

V. CONCLUSION

The purpose of energy consumption holds its highest importance due to the finite energy means. When the routing method is designed the first purpose is to retain sensors in running for possible long time and maximizing the lifespan of network. Today, mostly hierarchical routing protocols are planned to minimize the energy utilization as well as expand system's lifespan. LEACH is also a hierarchic routing protocol. LEACH is also used to minimize the energy utilization and to enhance the network lifetime. In the purposed RMCHS protocol CH selection is on the basis of energy, probability distance whereas in the earlier RMCHS protocol CH selection is randomly on the basis of distance. In the purposed RMCHS protocol percentage of alive nodes is increased, minimize the power usage, throughput is also increased in same number of rounds. Thus the results of purposed RMCHS protocol in terms of LEACH protocol present the minimum energy consumption and maximum lifespan of network.

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