ENERGY PROFICIENT METHOD BASED ON ADAPTIVE LOAD BALANCING ALGORITHM FOR WIRELESS SENSOR NETWORKS

B.Harish[1], M.Bhuvaneshwaran[2], S.Sathishkumar[3], Dr.S.Karthik[4]

ABSTRACT:

The wireless sensor network (WSN) has been an active research area for past few years but there is some limitations in energy and storage, it seems there is a need in a routing protocol for WSN. The energy and storage balance based on Adaptive Load Balancing Algorithm and Rainbow protocol for WSN is proposed in this paper. The Adaptive Load Balanced algorithm is define by the cross layer protocol and their main ingredients are geographic routing, load balancing and contention based relay selection. The Rainbow protocol has a mechanism with in and around the dead ends. The Adaptive load balancing algorithm and Rainbow protocol are collectively called as ALBA-R, the integration of those protocols are used for the balancing of energy and storage.

I. INTRODUCTION:

Wireless sensor network is widely used in the critical areas where the communication is temporarily required. The wireless sensor network consists of large number of wireless sensor nodes through which the communication is made. These nodes have many sensors; they sense the information present in the remote areas and sends to the base station. The information which passes through many nodes to reach the base station. The information has many possibilities to reach the base station. But we have to choose the minimal path and cost efficient path to reach with less amount of energy.

The nodes at which the information transfer should have high capacity to send the data with great accuracy and less cost. . For that, the system has to be implemented with efficient algorithm and protocol. Algorithms which are used in this is Low Energy Adaptive Clustering Hierarchy (LEACH), for hierarchical routing algorithm. Energy Efficient Uneven Clustering (EEUC) which consumes energy by inters cluster data forwarding.

It uses a periodic schedule to the node crossing but it does not synchronize the node and it is use for the dynamic scenarios. Energy is save by using the node to wake up only at the time of need, in rest of time it is in sleeping node. The information should be delivering with reliability and it should free from robustness. There are two forms of energy residual energy and initial energy which the initial energy is required for the initialization of every node and residual energy is used for the data transferring.

II. RELATED WORKS:

A. Low energy adaptive clustering Hierarchy (LEACH) Protocol

LEACH is a Wireless sensor network hierarchical routing algorithm which the nodes form their local clusters themselves.

The data are transfer from node to the cluster head and it spreads over the sink from the cluster head. The sink is spread from a cluster head and the cluster node gets the information from the node. These transfers are made in the start phase and in

Author for correspondence:
[1,2]UG Scholars,SNS College Of Technology, Coimbatore, India. E-mail id: bhuvadnp@gmail.com, harishcse94@gmail.com
[3]Assistant Professor, SNS College Of Technology, Coimbatore, India.
[4]Prof. & Dean, SNS College Of Technology, Coimbatore, India.

the setup phase it chooses number between 0 and 1. If the number is less than the certain threshold value T (n) then it is allocated as cluster head.

$$T(n)= \begin{cases} p/(1\text{-}p \times r \bmod(1/p)), & n\in G \\ 0, & else \end{cases}$$

Where 'p' is denoted as percentage of the cluster head, 'r' is denoted as current number of round and 'G' is denoted as set of nodes which are not yet cluster. The non cluster head node joins the cluster with greater strength by choosing the cluster head and then the data are received from all the cluster members by the cluster head and it is send to the sink. This type of data transfer is made in the steady state phase.

B. Sink

The original energy can be denoted as E and when it is drained the node dies but the energy of the sink can be added to the original energy. There is a fixed location for the sink node and sensor node to reduce the selection process. The sink node broadcast the message to the other cluster nodes in the sensing field. The distance between sink node and sensor node can be computed by receive the signal strength from the both sink node and sensor node. After the topological development process the central node can be assigned before that it cannot be nominated. There is a lot of topological development process to identify the central node.

C. Energy- Efficient Uneven Clustering (EEUC) Protocol

Energy efficient uneven clustering protocol in which uncertain cluster head uses un even competition ranges R_c to construct cluster for uneven sizes.

$$R_c = \left(1\text{-} c \frac{d_{max}\text{-}d(i,sink)}{d_{max}\text{-}d_{min}}\right) R_c^0 \tag{2}$$

Where d_{max} is denoted as the extreme distance and d_{min} is the shortest distance between the sink and nodes, d (i,sink) is distance between sink node and i. R_c^0 is a fixed value but R_c is changeable in order to differ their values. Value of the 'c' is change

from 0 to 1 based on the value of opposition range. The size of the cluster is larger when it is far away from the sink and it is smaller when it is closer to the sink. When the cluster is far from the sink it consumes little more energy. Hence the energy can be saved when the cluster is maintained in the closer range to the sink.

D. Network

Sensor node is randomly spread in the rectangular sensing field. In which, data are sent to the cluster head and then from cluster head to sink node. The distribution of node consists of the data which is in the rectangular W×H field. In this network model, the nodes are like each other (i.e) isomorphic they have restricted energy and communication ability. It consists of the N total number of nodes which has the data can be defined as V= (v1, v2…v).

III. EXISTING SYSTEM

I. Forward Aware Factor For Energy Balanced Routing Method

FAF-EBRM (Forward Aware Factor for Energy Balanced Routing Method) is widely used in large scale Wireless Sensor Network for static data collection and event detection mainly for the industrial application. This system balance the routing hence we can save some energy while transferring the data from one node to other.

This routing method is used to choose the node in the time of data transmission when an intermediate node fails. By the analysis of Data transmission in Wireless Sensor Network Forward Aware Factor is an efficient way to reduce the energy wastage by balance the routing. It selects the nearest node to the damaged node as a path to reach the destination with some path considerations. Some of the nearest node cannot further transfer to the another node in that case this system will go for selection of another node when it goes further it requires little more energy. By considering the energy we cannot go further with this protocol. If the newly selected node fails to connect with another node then it forms a defect called 'Energy hole' this wastes the energy by

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unwanted selection of nodes for the data transferring.

IV. PROPOSED SYSTEM

Adaptive Load-Balancing Algorithm, whose main ingredients (geographic map-reading, load balancing, contention-based transmit selection) are blended with a mechanism to route packets out and through the dead ends of the node, the Rainbow protocol. The combination of the two protocols such as ALBA and Rainbow ALBA-R results in the integrated solution for the converge

casting in WSNs even though it is connected it can be sparse and with connectivity holes. Achieves performance superior to existing protocols in terms of energy efficiency, packet delivery ratio (PDR), and latency. The Rainbow mechanism allows guarantee packet delivery in realistic deployment. Simulation results also show better performance than that of two recent proposals for routing around dead ends. The node selection is made by using this algorithm when there is a defect in the current node. The algorithm selects the proficient nodes at which the information is send safely and quickly with no defects.
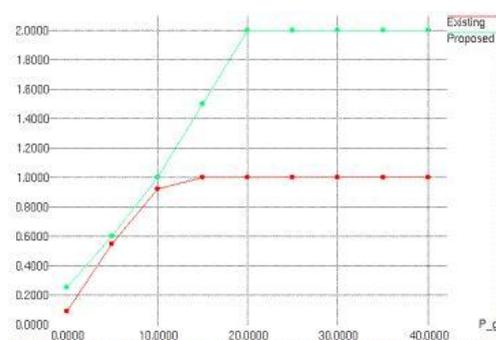

Fig 1. Data transfer rate

Fig 1. Shows the graph for data transfer rate through the various nodes. The existing system rate will increase gradually but proposed protocols have sudden increase in the rate of data transferring.
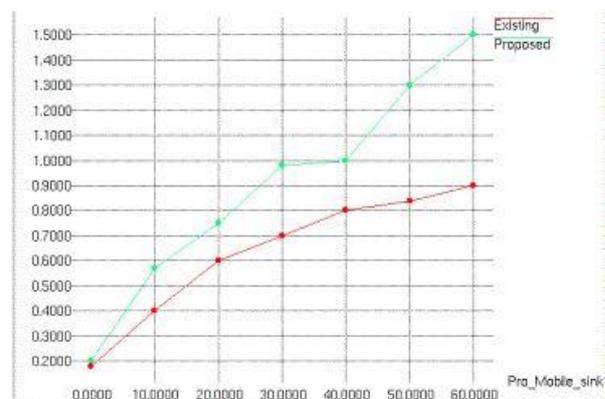
Fig 2. Energy consumption level

The energy consumption level of both the existing and proposed system will explain with this graph in Fig 2. There is a constant level of consumption in energy after gradual increase in both the protocols, but the proposed have more energy exclusion than the existing system.

V. CONCLUSION

In this paper, the energy is consuming while transferring the data through various nodes in wireless sensor networks. The energy is consumed by using Adaptive load balance algorithm for the selection of nodes in the time of any defect in the intermediate node. These proper node selections will produce a higher possibility of data transfer and energy consumption. The current development is made using Network Simulator.

VI. ACKNOWLEDGEMENT

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