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Load Dividing and Reclustering technique to Improve the Reliability of Data In a Network

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***Abstract*—** The organizing and scheduling of the network to conserve the energy of the node to accomplish better communication with the sink is the key challenge in a network. The numbers of techniques are established to cluster the network according to the distance of nodes from the sink. This paper presents a technique which allows the cluster to divide its load equally which helps to minimize the data loss. The cluster head selection takes place in two levels according to probability, threshold and its distance from sink. At level 0 cluster head selected will not take part in level 1 cluster head selection and aggregated data at level 0 is forwarded to level 1 cluster head according to their minimum distance concept. The data from cluster heads at level 1 is divided into two equal part so that to minimize the energy consumption and data loss.

***Keywords*—**Load Divide, Reclustering, Network levels, Stability period

I. INTRODUCTION

The number of key factor are considered in wireless sensor network applications like scheduling, energy consumption cluster head selection, data distribution. Each factor effect the network stability and life time of network. The organizing and scheduling of the network to conserve the energy of the node for accomplishing better communication with the sink is the key challenge in a network. The number of techniques are established to cluster the network according to the distance of nodes from the sink. This paper presents a technique which allows the cluster to divide its load equally which helps to minimize the data loss. The cluster head selection takes place in two levels according to probability, threshold and its distance from sink. At level 0 cluster head selected will not take part in level 1 cluster head selection and aggregated data at level 0 is forwarded to level 1 cluster head according to their minimum distance concept. The data from cluster heads at level 1 is divided into two equal part so that to minimize the energy consumption and data loss.

the Distance base and maximum remaining energy per round base cluster head selection helps the network to make communication without effecting the data, by applying the load dividing method among Cluster heads at level 1 allows the network to accomplish its task without data loss. By minimizing the data loss and reclustering formation improves the stability of the network.

The main objectives of the this proposed work in this paper are:

1. To improve the stability of the network by designing the proposed network according to level Cluster head selection and reclustering formation.
2. To minimize the packet loss by accomplishing the load divide technique at level 1.
3. To calculate the performance of network by comparing the proposed technique with the conventional technique.

II. PREVIOUS WORK

Koulin Yuan et al[5] in their paper mention a level based cluster distribution according to distance from base station, this method helps to improve better communication of nodes with base station this also helps in balancing the network. If load dividing among nodes at each level is introduced, this will help to increase the stability of network.

Jaswant Singh Raghuwanshi et al[1] in there paper proposed a method for reclustering and multihop data transmission processes reporting to base station by sensor node. This paper implemented a method that evenly distributes the energy all over the sensor nodes and by reducing the total energy dissipation, the lifetime of the network is enhanced,

The model works in phases and in each phase CHs are selected according to thrush hold values.

III. PROPOSED METHODOLOGY

The Proposed approaches works in 3 level (level 0, level 1 and level 2). In level 0 cluster head is selected on the basis of probabilistic threshold (based on remaining energy), in level 1 the cluster heads are selected and formation of cluster is accomplished. In level 2 reclustering process starts where all the selected cluster heads reselect the second level cluster heads using threshold which is based on nodes remaining energy and distance to base station. In level 1 Chs selected are those who do not take part in level 0 as Chs. The probability for initial cluster head used to calculate the threshold for cluster head selection and determines the number of cluster head in each round. This depends by varying the value of kinitial (kinitial =predefine probability × total sensor nodes). This kinitial value helps to increase the stability of network by increasing the value of kinitial, numbers of cluster heads are increases. Then the data aggradation and distribution at level 1 is accomplished by dividing data equally to the near CHs or BS, it also depends upon the distance from that CH. This helps to improve the data transmission without lost and increase the stability of the network allowing load balancing in level 1 and data compression. The cluster head election and cluster formation process in levels 0 and level 1 is based on following equation as:

Level 0: In this level, the process of formation of cluster occur and selection of cluster head election. In the cluster head election process each sensor node chooses a random number between 0 and 1 separately. If this number is lower than the calculated threshold T(i) for sensor node i, then the sensor node i become a cluster head.

$$T(i) = \left(\frac{Pc}{1-Pc*mod\left(r,round\left(\frac{1}{Pc}\right)\right)}\right) * Erem/Emax$$

Where

Pc is the optimal probability for initial cluster head r is the current round, Erem is the remaning energy of sensor node and Emax is the maximum or initial energy of sensor nodes.

Level 1: In this level the second process of cluster head selection is done in which those cluster heads amomg nodes are selected who do not become the cluster heads in level 0. The selection process of cluster heads in this level is based threshold T(s) shown below:

$$T(s) = \left(\frac{Psc}{1-Psc*mod\left(r,round\left(\frac{1}{Psc}\right)\right)}\right) * \frac{Erem}{Emax} * Dmax/D$$

Where

Psc is called optimal probability for second level cluster heads, Dmax is the maximum distance of sensing field and D is called the distance between sensor node and base station

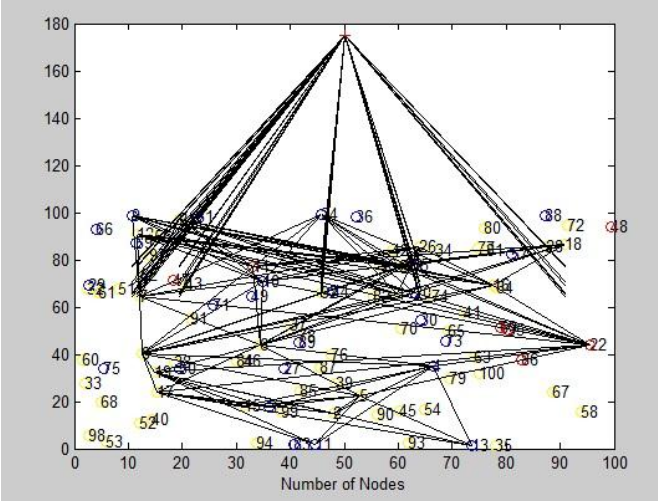

Figure 1. Network Layout Model

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IV. RESULTS AND DISCUSSION

The stability period, data loss, load balancing and network lifetime are used as key indicators to calculate the performance of network in this proposed approach. The stability period is calculated by the time interval from the start of the operation to the first node dies. The network lifetime is the time interval from the start of operation to the last node dies. The network consist of 100X 100 m2 area field, 100 nodes, Pc=0.5 and Psc=0.2 with packet size 4000 bits, the base station at 50X175 m.

The Figure 2 defines the network life time by increasing the alive nodes per round. The proposed method have nearly 42 nodes alive at 2000 round.

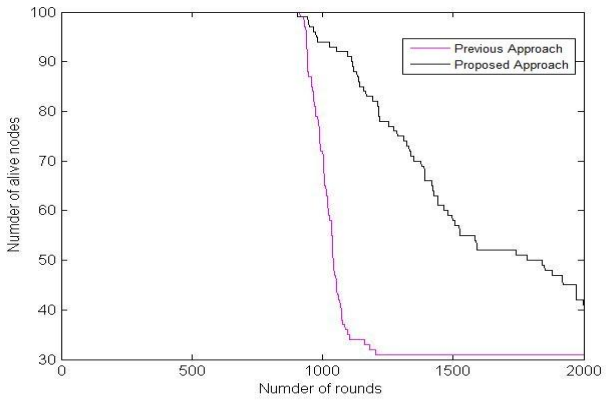

Figure 2. Analysis of Network Lifetime using alive nodes

The figure 3 and figure 4 defines the remaining energy per round for better selection of CHs per round and defines the Kth in each level.

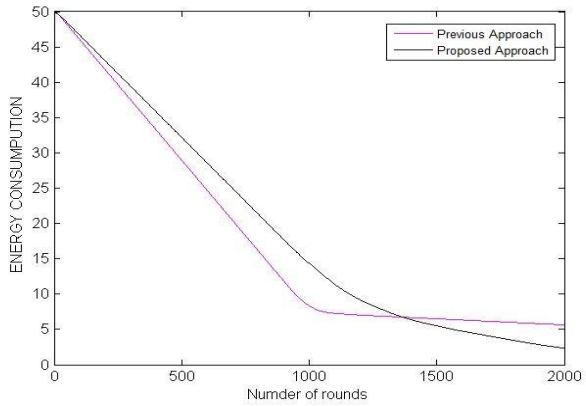

Figure 3. Analysis of Energy consumption

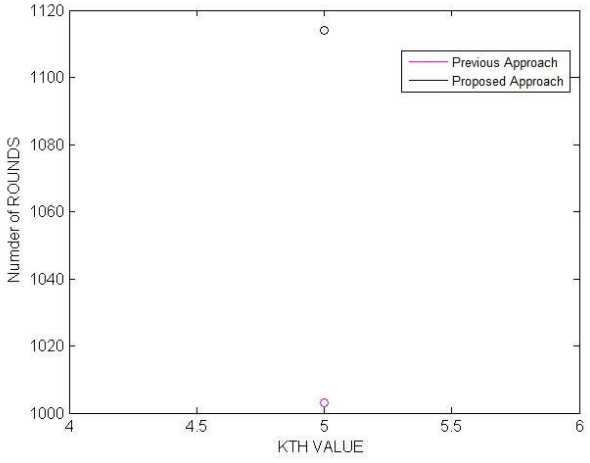

Figure 4. Analysis of Kth value per round

V. CONCLUSION and Future Scope

In this dissertation the Distance base and maximum remaining energy per round base cluster head selection helps the network to make communication without effecting the data, by applying the load dividing method among Cluster heads at level 1 allows the network to accomplish its task without data loss. By minimizing the data loss and reclustering formation improves the stability of the network. In future work the compression technique at level 1 will help to send more data packets in minimum energy consumption.

ACKNOWLEDGMENT

The about contents and research method we used is true to my knowledge and the result at every step we concluded is according to my research work.

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