Improvement of the sensor coverage density and life time Network in Wireless Sensor Networks

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Abstract— Energy Efficiency and sensing coverage distance are essential metrics for enhancing the lifetime and the utilization of wireless sensor networks. Its growth is expeditiously increasing and that's why there is an immense field for research in this area. Sensors depend entirely on the trust of their battery of power, which can't be revitalized or substituted. So the design of energy aware protocol is essential in respect to enhance the lifetime network. LEACH is an energy efficient hierarchical based protocol that balances the energy expenses, saves the node energy and hence to prolongs the lifetime of the network. An efficient power saving scheme and corresponding algorithm must be developed and designed in order to provide reasonable energy consumption and to improve the network lifetime for wireless sensor network systems. The cluster-based technique is one of the approaches to reduce energy consumption in wireless sensor networks. The simulation of the work has been carried out by using own set of parameters and in the last of the paper conclusions is drawn.

Keywords— LEACH, SLEEP, Network Simulator, Life time Network

I. INTRODUCTION

Recently, there has been a rapid growth in the wireless communication technique. A wireless sensor network consists of a large number of sensor nodes. Each sensor node has sensing, computing, and wireless communications capability. Some technologies even offer Global Positioning System (GPS) capabilities that can pinpoint the location of the device anywhere in the world. In order to increase energy efficiency and extend the network lifetime, new and efficient power saving algorithms must be developed. Low Energy Adaptive Clustering Hierarchy (LEACH) is a typical cluster-based protocol using a distributed clustering formation algorithm. In LEACH, the large number of sensor nodes will be divided into several clusters.

The sensor nodes senses the physical quantity is being measured and coverts it into an electrical signal. After that the signal is fed to an A/D converter and is ready to be used by the processor [1].The problem of coverage in heterogeneous planar sensor networks. Coverage as a performance metric, quantifies the quality of monitoring provided by the sensor network. [2]. The fundamental objectives of the WSN are most reliability, accuracy, flexibility, cost effectiveness, and ease of deployment. The WSN is made up of individual multifunctional sensor nodes [3].

As we know that wireless sensor network mainly consists of tiny sensor node which is equipped with a limited power source. The life span of an energy network is constrained sensor network is determined by fastly the sensor consumes energy. A node in the network is no longer useful when its battery dies. Researchers are now developing new routing mechanisms for sensor networks to save energy and pro-long the sensor lifespan. The dynamic clustering protocol allows us to space out the lifespan of the nodes, allowing its do the minimum works it needs to transmit the data [4].

The WSN can be applied to a wide range of applications, such as environment management monitoring, industrial sensing and infrastructure protection, temperature sensing. In this paper, to address his problem of energy efficiency reliable it is essentially to improve the energy efficient to enhance the quality of application service, routing in wireless networks in the presence of unreliable communication links or devices or loss wireless link layers by integrating the power control techniques into the energy efficient routing. The link layer implements a perfect reliability and the case when the reliability is implemented through the transport layer [5].

Nodes in an ad hoc network have limited power resources as well as limited the processing power. When a routing, a sharp degradation in the network service may result if the routing algorithm does not account for the limited resources, eventually decreasing the lifetime network [6]. To maximize network lifetime, the paths for message flows are chosen in such a way that the total energy consumed along the path is minimized while avoiding the energy in the depleted nodes. To finding the path network which consume minimum energy and finding paths which do not use energy depleted nodes lead to conflicting objectives [7]. In contrast to conventional power aware algorithms, The MRPC identifies the capacity of a node just by its residual battery energy, but also been the expected energy spent in reliably packet over forwarding the specific link. The formulation method captures the scenarios of transmission costs also has depend on physical distances between nodes and the link error rates [8].

A realistic power consumption model of the wireless communication subsystems can be typically used in many sensor network node devices is presented. The simple power consumption models for major components are individually identified; the effective transmission range of the sensor node is modelled by the output power of the transmitting a power

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amplifier, to sensitivity of the receiving low noise amplifier, and RF environment [9].

Traditionally, the PSR method is estimated to fraction of successful transmissions over a window of a test packet, to demonstrate that counting based methods do not react to changes in the wireless channel fast enough and that the only way to address this problem is to estimate the PSR based on the receiver's characteristics and on the signal to noise ratio (SNR) at the receiver [10].

II. CAFEE-CLUSTERING ALGORITHM FOR ENERGY EFFICIENT

The modify k-means algorithm to make an ideal distribution for sensor node clusters by using the information of location and residual energy for all sensor nodes. Based on the centralized clustering architecture, here proposed a clustering algorithm to provide efficient energy consumption and better network lifetime in the wireless sensor networks named CAFEE (Clustering Algorithm for Energy Efficient). The main goal of this phase is to create clusters and find cluster head nodes. During the set-up phase, the BS collects the information of the position and energy level from all sensor nodes in the networks. Based on the characteristics of stationary sensor nodes, the suitable initial means of points for clusters can be obtained. However, the cluster head nodes are selected by creating some clusters in our proposed algorithm.

- *Routing*

Low Energy Adaptive Clustering Hierarchy protocol is the first hierarchical cluster based routing protocol for wireless sensor network which partitions the nodes into cluster, in each clusters dedicated to the node with extra privileges called Cluster Head (CH) is responsible for creating and manipulating a TDMA (Time Division Multiple Access) schedule and sending aggregated data from nodes to the BS where these data is needed using CDMA.
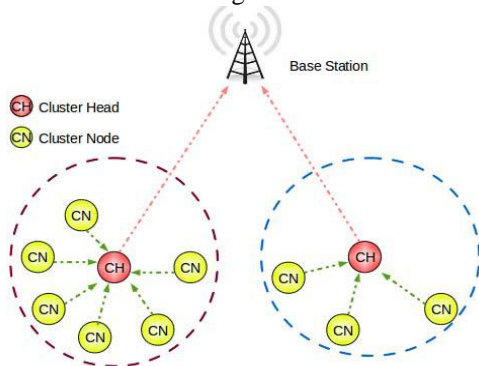

Fig .1 Cluster based Routing

The sensor nodes can be communication each other without via base station and the sensor networks application may be one of method or combine two kinds of methods. For example, CAFEE in categorization of the sensor nodes into many clusters, and according to the algorithm select one of clusters head of them. The clusters head will be a management and then the process of the nodes been cluster, then communication between the node and sink. The cluster head is like a base station.

- *Minimum Energy cost Routing*

Reliability and energy cost of routes must be considered in route section. The key point is that the energy of the cost route is related its reliability. If the routes are less reliable, the probability of the packet transmission increases. Thus, larger amount of the energy will be consumed per packet due to retransmissions of the packet. By defining ways of computing the energy cost of routes, design sets of energy-aware reliable routing algorithms for HBH and E2E systems. They are called Low Energy Adaptive Reliable Routing (LEARR).

III. SLEEP PROTOCOL

The purpose of this protocol subjects are shielded from all time cues, often by a constant light protocol, by a constant dark protocol or by the use of light/dark conditions to which the organism cannot entrain such as the ultra short protocol of one hour dark and two hours light..

Get to sleep (get back to sleep)

1. as soon as sleep protocols are awake and its try to get back to sleep immediately. This is a time to not a ponder, plan, to ruminate or rehearse. Observe the urge and return to getting back to sleep.

2. Stay physically drowsy. To move at all, at only once, and it's gently so as not to wake up. Don't turn on the light. To Use relaxation techniques: (1) Scan the body in a calm and leisurely method.

IV. NETWORK SIMULATOR

Network simulation is a technique where a program models the behaviour of a network either by calculating the interaction between the different network entities using a mathematical formulas or actually capturing and playing back observations from a production network. Network simulation plays a vital role in communication and computer network in which program models the behaviour of a network by calculating the interaction between the different network entities using mathematical formulas. The behaviour of the network can be observed in a test lab.

Network simulator software predicts the behaviour of a computer network. In simulators the computer network modelled and then performance is analysed. Typically the users can they customize the simulator for their specific needs. Usually simulator come with support for the protocols and network in use such as WLAN, Wi-Max, TCP, WSN, cognitive radio. Network simulator can also provide other tools to facilitate visual analysis.

Network Simulator (version 2), widely known as ns-2, is simply a discrete event driven network simulation tool for studying the dynamic nature of communication networks. It is an open source solution implementation in C++ and Otcl programming languages. NS-2 provides a highly modular platform for wired and wireless simulations supporting different network element, protocol traffic, and routing types. In general, ns-2 provides users with a way of specifying network protocols and simulating their corresponding

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behaviours. Result of the simulation is provided within a trace file that contains all occurred events.

V. EXPERIMENTAL RESULTS

- *Existing Model:*

To evaluate the performance of RMECR and RMER algorithms, to consider the network in which nodes are uniformly distributed in a square area. Nodes are assumed to be static. If there is no error in the header and preamble the payload method is detected. Nevertheless, the payload is detected erroneously, the packet will be dropped. Increasing the transmission range reduces the number of times a packet needs to be forwarded en route to its final destination.

- *NAM OUTPUT*
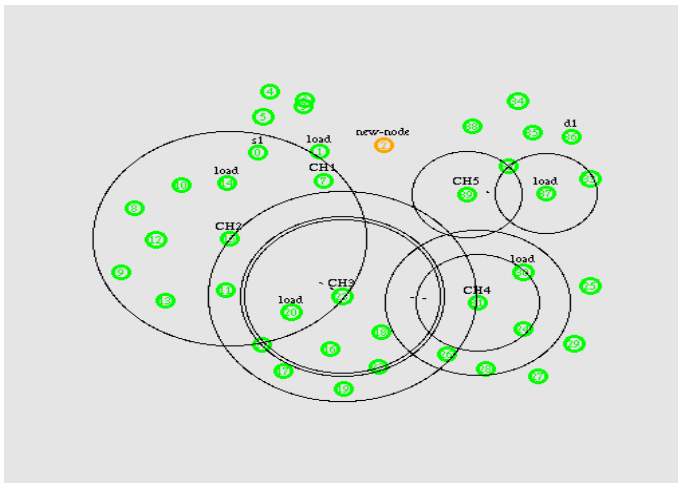
Fig .2 Existing NAM output

In this NAM – output has represents to been the nodes has to been transferred to a group of clusters the node 2 has to send a one cluster to another cluster. The total value of the nodes has been erased.
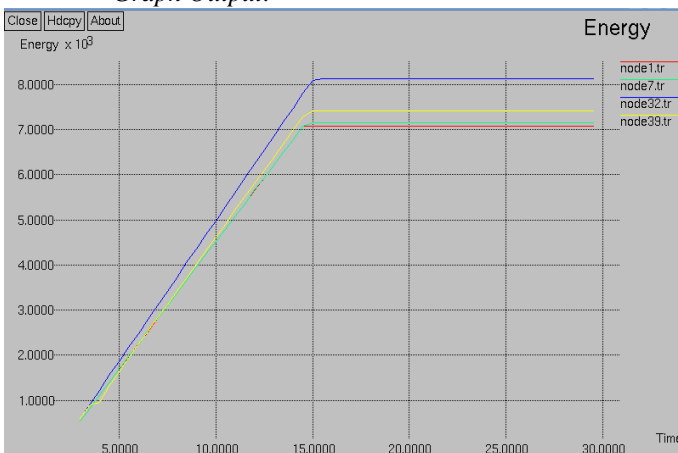
- *Graph Output:*

Fig.3 Energy diagram of existing system.

The fig.1 denotes the energy diagram of existing system. In this system the threshold value only fixed to the node operation. The source node and destination nodes are automatically considered. For this node threshold value decreases the packet losses will be created.

- *Proposed Method:*

The proposed method the energy efficient based life time network has used for and to create nodes, it forms to a group of clusters. The packet data has delivered to cluster. The PDR (Packet to Delivery Ratio) represents for a ratio of delivered the packets.

- *NAM Output:*

The NAM output produced for the animated output for to deliver the data packets into the node. In order to been the source node and Destination node has selected. The Load node has been selected to high amount of the energy node, the data has been passed to source to destination.
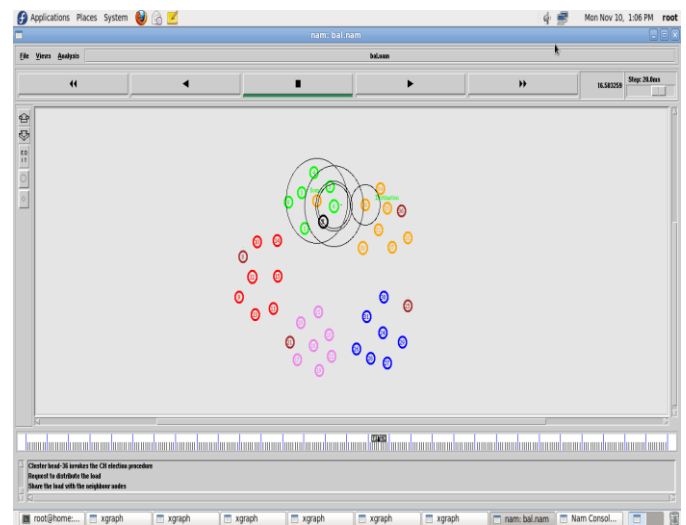

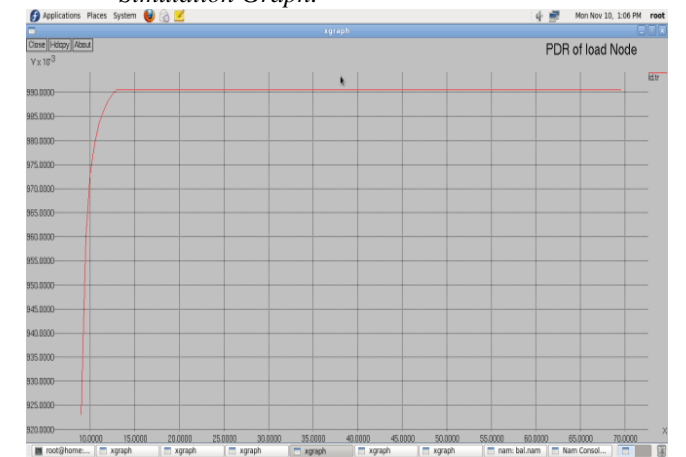Fig .4 Proposed NAM Output

- *Simulation Graph:*

Fig.5 PDR of load node

For the simulation process the threshold value, Source node, Destination node and load node has been created. For the simulation process the source node has been to deliver the data between packet delivery ratios. In order to the process the load node has varied by means of threshold value. The data has delivered by clusters by means of load node.

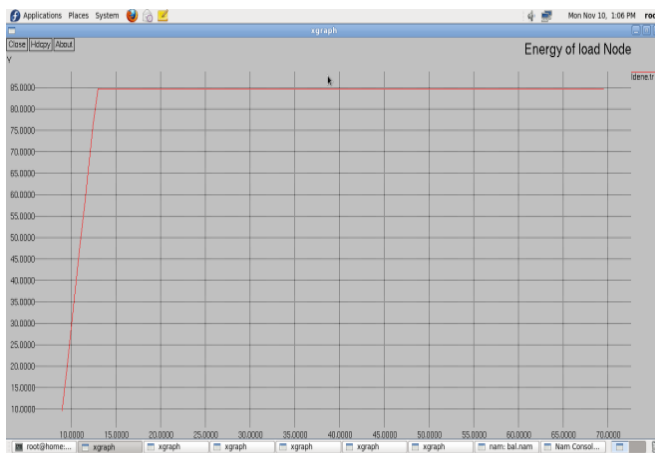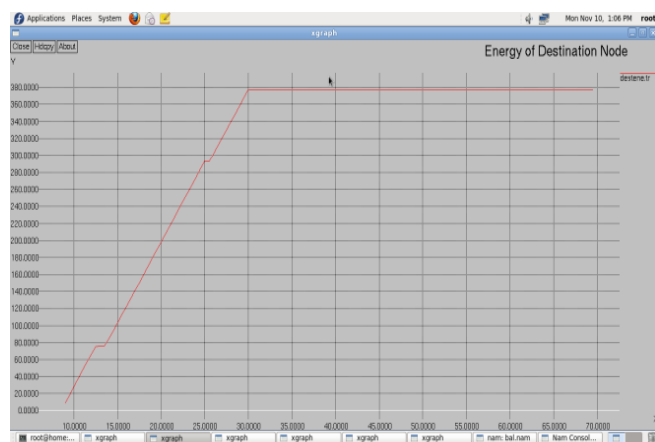

Fig.6 Energy of Load node

Fig.7 Energy of Destination Node

The above graph mentioned to that the energy of an the source and destination, The value has been constant in order to using the Load node, it named as alternate node. This method has processed to been the packet delivery ratio.
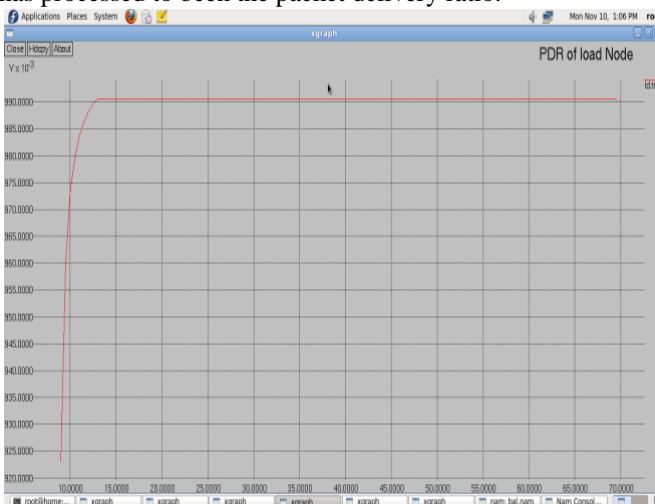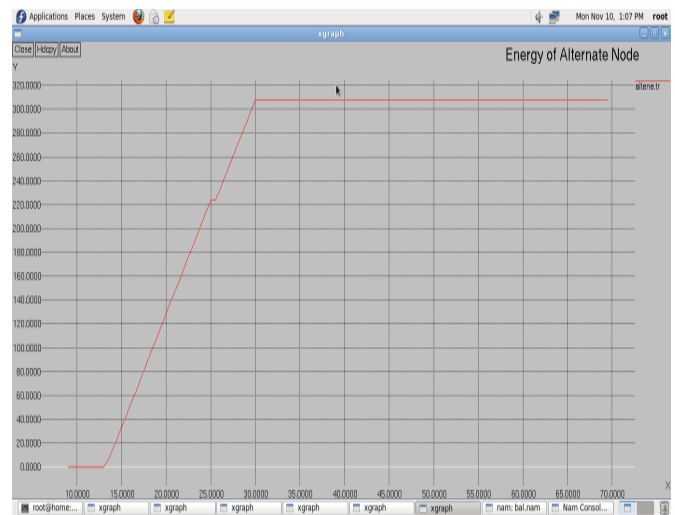

Fig .8 PDR of Load Node

Fig .9 Energy of Destination Node

This method has processed to been Energy value of the Destination node, because of that alternate node has been changed to that value of threshold voltage.

VI. CONCLUSION

The energy saving method is a challenging issue of the wireless sensor networks. In order to increase Energy Efficient and extend to the lifetime of the sensor node, a new methods and efficient energy saving schemes must been developed. In this proposed scheme, we calculate the average distance between the sensor nodes and take into account the residual energy for selecting the appropriate cluster head nodes. The lifetime of wireless sensor networks is extended by using the uniform cluster location and balancing the network loading among the clusters. Simulation results indicate our proposed algorithm achieves the low energy consumption and better network lifetime in the wireless sensor networks.

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