

Improving Energy Efficient in Wireless Sensor Network by using Artificial Neural Network

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Abstract:- The Wireless Sensor Network (WSN) can be used in various organization, more issues in WSN. Sometimes energy consumption of sensor node is high and node will be dead in certain time. In this paper proposed techniques provides two mechanisms Energy aware distributed clustering (EADC) and Energy aware multicast clustering (EAMC). Using Artificial neural network to provides the efficient threshold value for analyzing the sensor node level. MD5 (Message Digest) algorithm is used for securing the chief node in the network. MD5 algorithm is secure transaction by encrypting data from source and transmitted to destination and respective key is needed by authorized receiver to decrypt file in destination. In this techniques to avoid the workload, improve energy efficiency of each node and secured data transaction.

I. INTRODUCTION

The wireless sensor network is mostly used for transmission of data from source to destination. Wireless sensor network works depends upon communication distance, energy, processing capacity, surrounding environment. Selection Cluster head is compare with the competitor node in the network, cluster head role is shifted to the other sensor node to makes better balance of energy consumption. Artificial neural network provides threshold value to maintain the sensor node energy consumption and select the chief node depends on the output value of sensor node in the network. If checks sensor node with lower energy than threshold value, node switch into sleep mode and maintain energy efficient in network. Using group based network, which decreases energy consumption and sensor node cannot dead in the network. The secured data transaction between the source to destination using MD5 algorithm. Encryption and decryption process are used for secure data transaction, generating security key in all sensor node and securing chief node in the network.

II. LITERATURE SURVEY

Analysis of previous paper, wireless sensor network having high energy consumption and more workload between source to destination. Multiple sensor node communication are not managed properly, information cannot be reach properly in the receiver of network because energy level will be reduces for long communication range and node can be dead in specific period of time.

In the previous paper, wireless sensor network having more issues there is battery of sensor node impossible to change in network, time consumption and energy consumption is high. The secure data transaction is not available, third party will be easily hacking the information in the network, more important to concentrate transmission of information between source to destination. The proposed techniques overcomes drawbacks of previous paper, using two mechanisms Energy aware distributed clustering and energy aware multicast clustering for transmitting the packet to destination and MD5 algorithm for secure data transaction.

III. PROPOSED SYSTEM

The proposed system used EAMC and EADC mechanisms using artificial neural network. Cluster head node is selected in network it will be transmitting the packet into neighbor node with help of Energy aware multicast clustering. Energy aware distributed clustering is distributed packet into all group based network. Using artificial neural network, it will be provides an efficient threshold value and select chief node in network. The node is switch into sleep mode, if identifies node with low energy than threshold value and it will be maintain the energy efficient in all node.

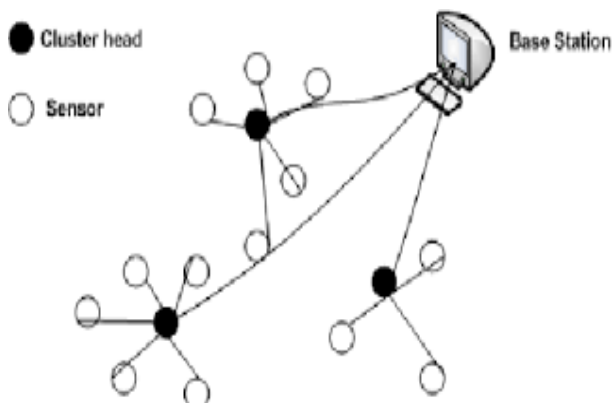


Fig 1:- Cluster Head Selection

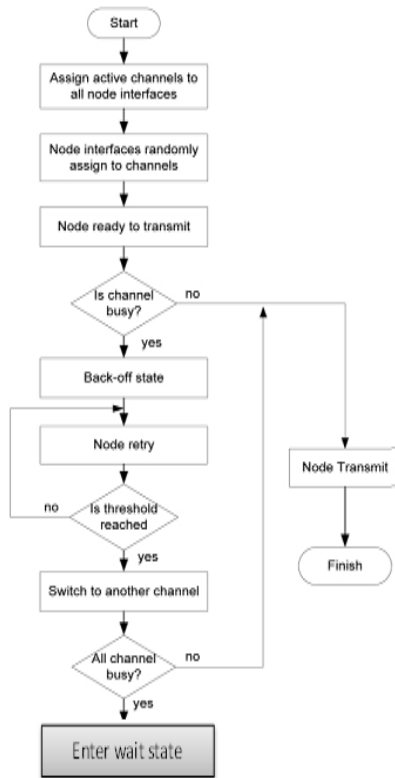


Fig 2:- System Overview Architecture

A. The following modules are present in this paper

- Node construction
- Shortest path calculation
- Chief node selection
- Security in chief node

B. Node construction

In this modules, assign the active node in the network. Two or more sensor node forms group based network and transmitting data from source to destination. Using the proposed mechanisms reduces energy consumption and improving network life time.

C. Shortest path Calculation

In this modules, calculate the shortest path of sensor node between source to base station. Calculation is based on the workload, traffic, distance of cluster head to nearest neighbor node. Using this details to select the shortest path and transmitting the information to destination, it will be reduces time consumption.

D. Chief Node Selection

Using artificial neural network two nodes are selected in network, chief node select depends upon the highest output value and next highest value choose cluster head node. ANN provides the efficient threshold values, node is switch into sleep mode if identifies node lower energy than threshold value and node cannot be dead. Energy will be maintained efficiently in the network.

E. Security in Chief Node

The secure data transaction between source and destination has been implemented in this module. MD5 algorithm is utilized to enable secure data transaction by encrypting data from source and transmitted to destination. In destination respective key is need by authorized receiver to decrypt file. Therefore data transaction is done with minimum energy consumption and attains security while transferring packet

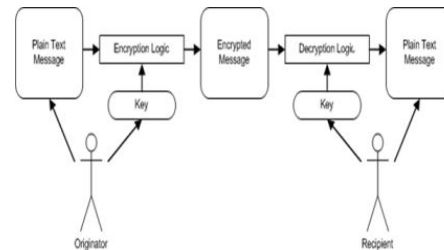


Fig 3:- Securing Chief Node

IV. SIMULATION AND RESULTS

The simulations can be performed with NS2 simulator for the Wireless sensor network. The Analysis of energy consumption, throughput performances and end to end delay in the network

Simulation parameters	Value
Network area	800m*600m
Number of nodes	20
Mobility Model	Random way point with 0,50,100,150,200,250,300
Transmission Range	250m
Data packet	Constant with 512 bytes packet size 1packet/s
Simulation Time	300s
Maximum speed	20 m/s

Table 1. Simulation parameters in network

The table 1. shows about the simulation parameter in network such as network area, number of node, transmission range, data packet, simulation time, maximum speed

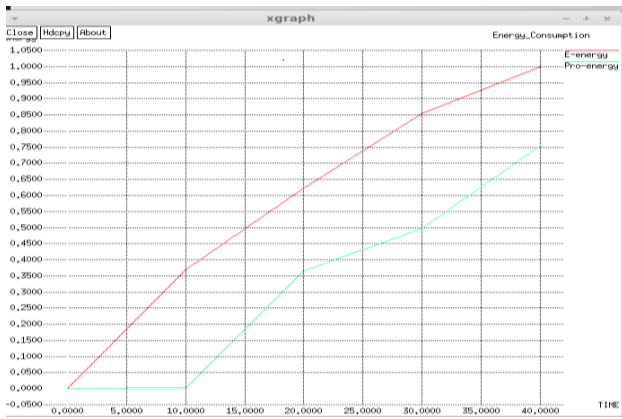


Fig 4:- Analysis of Energy Consumption

The Fig 4 shows the Energy Consumption as function of time, amount of energy consumed by EADC with respect to its competitor protocols x-axis represents as time and y-axis represents as energy, reduces energy consumption in proposed protocol.

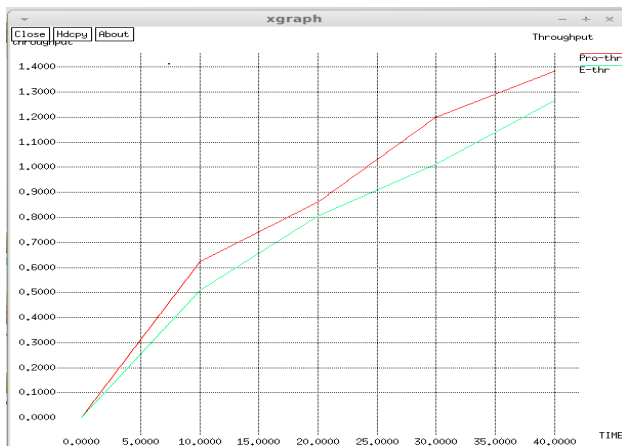


Fig 5:- Analysis of Throughput Performance

The Fig 5 shows the analysis of throughput performance. The x-axis represents as time and y-axis represents as throughput, throughput performance will be increased compare with competitor protocol.

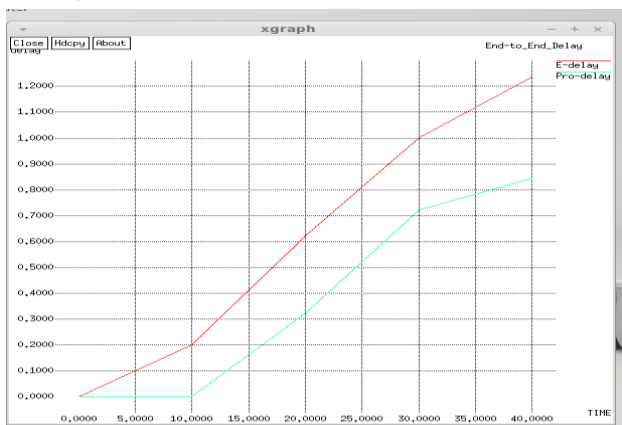


Fig 6:- Analysis of End to End delay

The Fig 6 shows the Analysis of end to end delay. Data is transmitted into number of group in the network, x-axis

represents as time and y-axis represents as delay. In the proposed technique reduces end to end delay in the network and data will be transfer to base station.

V. RESULTS

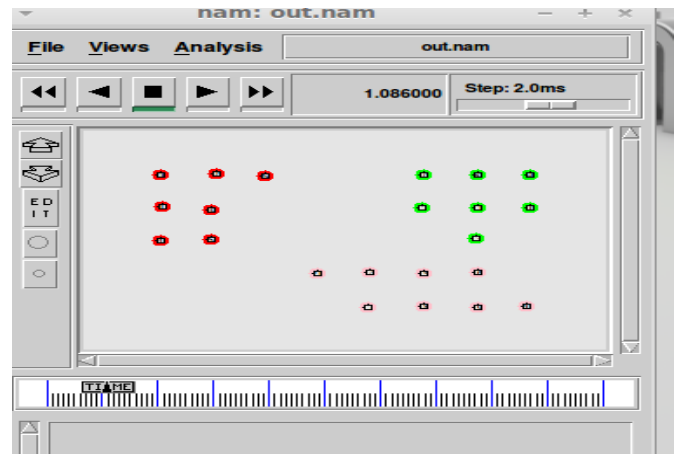


Fig 7:- Node Construction

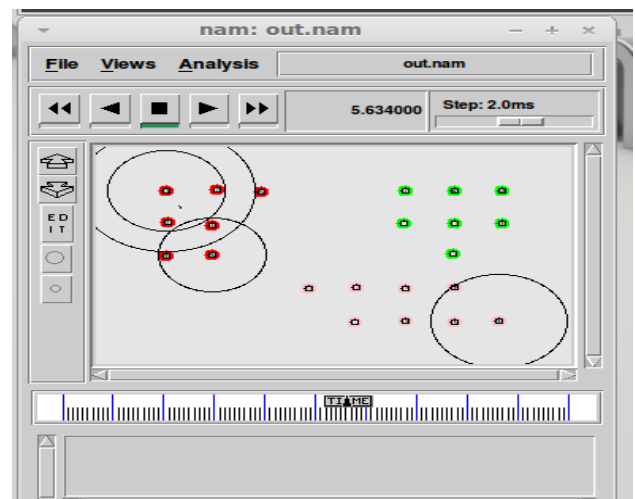


Fig 8:- Find Shortest Path

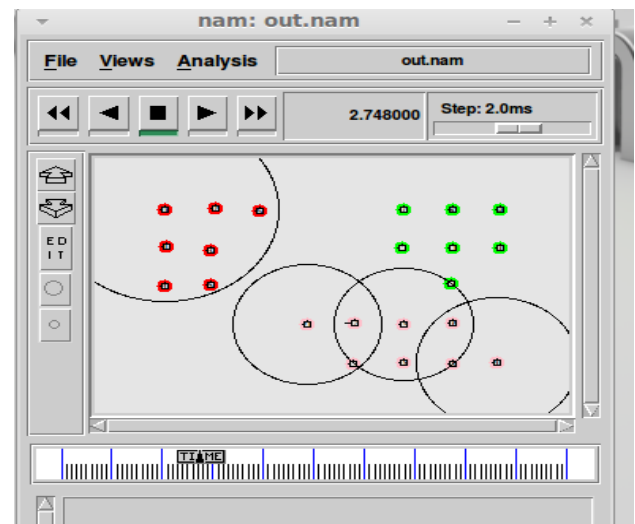


Fig 9:- Distributed Packet to all node

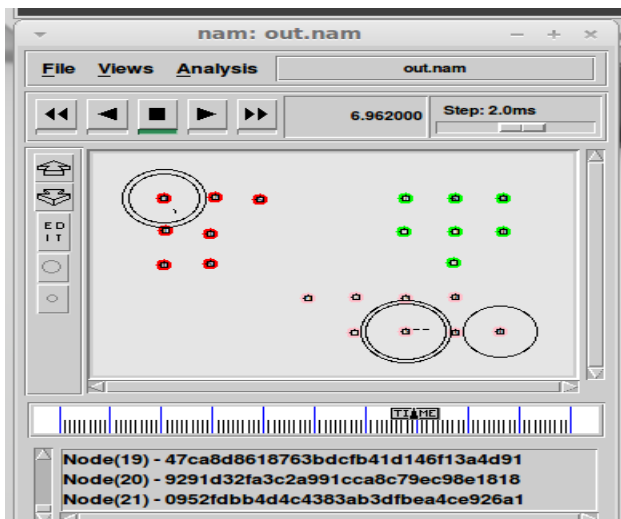


Fig 10:- Data Encryption and Decryption Process

VI. CONCLUSION

In this paper, two proposed protocols are used: energy aware multicast clustering (EAMC) and energy efficient distributed clustering (EADC). A group-based network is used for transmitting data from source to destination. In the proposed techniques, energy efficiency, network lifetime, and sensor node survival are improved. The MD5 algorithm is used for secure data transactions. In the future, securing chief nodes by using efficient security algorithms for transmitting packets from source to destination is a goal.

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