ISSN XXXX XXXX © 2018 IJESC

Research Article Volume 8 Issue No.3

Energy Consumption Analysis of Static and Mobile WSN Using Manual Sink Placement Using Ns3

M.shunmathi[1], S.Parathasarathi[2], Dr.K.Hariharan[3]
PG student[1], Assistant Professor[2], Associate Processor[3]
Department of Mechatronics[1, 2], Department of ECE[3]
Thiagarajar College of Engineering, India

Abstract:
The sink deployment in the form of deploying the sink among different sites so as to leverage traffic burden is shown to be a promising scheme to save energy and prolong network lifetime in wireless sensor networks. The optimal deployment problem for the sink in wireless sensor networks in routing issues are naturally involved. The data collected by sensor nodes are forwarded to the sink, therefore proper placement of sinks has a great impact on the performance of the WSN.The major contribution of the development of an efficient based algorithm to solve this problem. To dividing the continuous search space into a limited number of communication intersections, computational complexity has been significantly reduced. A formal proof of optimally for this program is given and several parameters have been revealed theoretic analysis as well as simulating results using network simulator3.

Keywords: communication, energy efficient, wireless sensor network

I. INTRODUCTION

Wireless sensor network (WSN) have emerged as research areas with a great effect on practical application developments. They permit fine gain observation of the ambient environment at an economical cost much lower than currently possible. In hostile environments where human participant ion may be too dangerous sensor networks may provide a robust service. A wireless sensor network consists of base station and a number of wireless sensors (nodes). In sensor network are designed to transmit data from an array of sensor nodes to a data repository on a server. The advances in the integration of microprocessor and wireless communication technology have enabled the deployment of large scale wireless sensor network. In wireless sensor network lies in the ability to deploy large number of tiny nodes the assemble and configure themselves. In wireless sensor network become increasingly useful in variety critical applications, such as environmental monitoring, smart offices and transportation traffic monitoring, In order to achieve high quality and fault-tolerant capability a sensor network can be composed of hundred sensor nodes, which are often randomly deployed inside the interested area or very close to it. The node has sensing, data processing and wireless communication components. Sensor nodes are deployed randomly in the deployment region under examination and collect sensor data. when sensor network are deployed in hostile environment security becomes more important as prone to different types of malicious attacks. In order to provide security for sensor network, key management is applied many protocols and algorithms have been proposed for traditional wireless adhoc network, they are not well suited for the unique features and application requirements of wireless sensor network. To develop energy efficient protocols for reducing energy consumption. one of the well known energy efficient methods is the clustering based algorithm which is designed for homogenous wireless sensor network. The clustering algorithm were also improved and applied to the heterogeneous wireless sensor network. Recent advance in wireless communication technologies have enabled the development of large scale sensor network that consist of many low power, low cost, small size sensor nodes. sensor network hold the promise of facilitating large scale and real time data processing in complex environments. A large number of keys must be managed in order to encrypt and authenticate all sensitive data. The objective of key management is to dynamically establish and maintain secure channels among communicating parties. The communication channel between two nodes that are in direct or indirect communication or they may be group keys shared by multiple nodes. In network keys may need to be changed to maintain secrecy and resiliency to attacks of the network topology changes key management entails the basic functions of generation and distribution of network keys. In many wireless sensor network also utilize minimal capacity devices which place a further strain on the ability to use past solution. since WSN is usually exposed to atrocious and dynamic environments, it is possible for the loss of connectivity of individual nodes. Conventional centralized algorithm need to operate with global knowledge of the whole network and an error in transmission or a failure of a critical node will potentially cause a serious protocol failure. It is realized that localized algorithms are more scalable and robust the centralized algorithm. In wireless sensor network it is an important task to collect the data periodically from various sensor nodes for monitoring and recording the physical conditions of the environment. The sensor data must be transmitted and received between the nodes in the network. The wireless sensor network is a broadcast network it consist of a large number of sensors that are effective for gathering data in a variety of environment. since the sensors operate on battery power it is a great challenging aim to design the energy efficient routing protocols. In benefits of low power and low cost, rapid deployment for many applications that do not need human supervision.

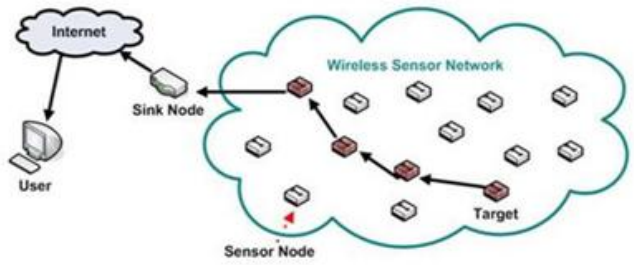


Figure.1. Wireless sensor network

II. PROBLEM STATEMENT

1. Objective

1.The basic aim while structuring in wireless sensor network is to minimize the energy consumption and maximize the network life time.
2. To develop a optimum sink placement algorithm and analyze the energy consumption of the network.

2. Methodology

i.To construct a core module of the wireless sensor network.
ii.To set the value of transmitting current, receiving current.
iii.To initialize the value of start and stop time of the transmission.
iv.To simulate the network parameters and analyze the network life time.
v.To analyze the energy consumption of the network.

3.Simulation Parameters:

To simulate the energy consumption of the wireless sensor network. In sink to place in centre, end of the network. In each simulation run in 500 seconds. To analyze the wireless sensor network life time.

Table.1. Simulation results

PARAMETERS	PARAMETER VALUE
Simulation	NS3
Nodes	49
Simulation time	500 seconds
MAC protocol	IEEE 802.11
Channel	Wireless
Model	Mobile,static

III.PROPOSED WORK

The proposed work performed with help of optimum sink placement by NS3 simulator. In sink placement algorithm to find the optimal place for locating the sink. The performance analysis has also done in network life time, throughput ,packet delay.

A. Geographic sink placement:

The GSP strategy is designed to work for uniformly distributed networks. The sinks are placed at the centre of gravity of a sector of a circle. The only information required is the size of the sensor field. The centre of gravity of a sector with angle alpha always lies on the middle radial line of that sector. The middle radial line of a sector and the centre of gravity is simply found by multiplying with radius(R). If the sink is placed at the centroid of the nodes in a grid cell then the position of the sink.

B. Grid size estimation:

To find the area or region having densely depolyed sensor nodes. Therefore determining the size of the grid cell is very important. Let communication range of each sensor node be Riff the sink is placed at the centroid of the nodes in a grid cell then the position of the sink can be anywhere within the grid cell and one vertex of the grid cell will be the farthest point from the sink. so if a node is at the farthest point then it can only communicate with the sink if the distance is less than or equal to R. The sink is placed at one vertex of the grid then the maximum distance of a node from the sink is the distance of the diagonally opposite vertex and the distance should be at most R.

IV.RESULTS

The required parameter to analyze a network life time. To place a sink in four ways static sink at centre, static sink at end, mobile sink at centre, mobile sink at centre.

1.AVERAGE RESIDUAL ENERGY

The current value of energy in a node after receiving or transmitting routing packets.

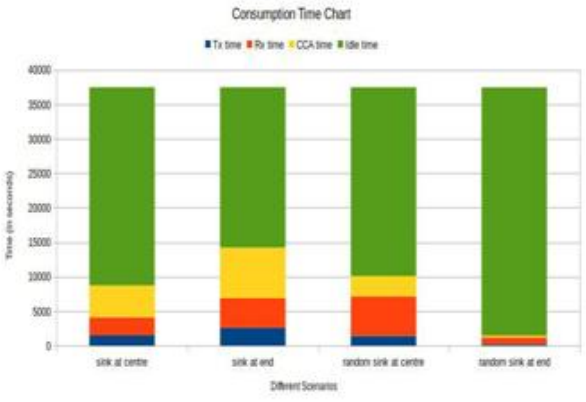
2. THROUGHPUT

The ratio between the actual numbers of packets transmitted by the nodes in the system to the number of successfully delivered packets at the base station.

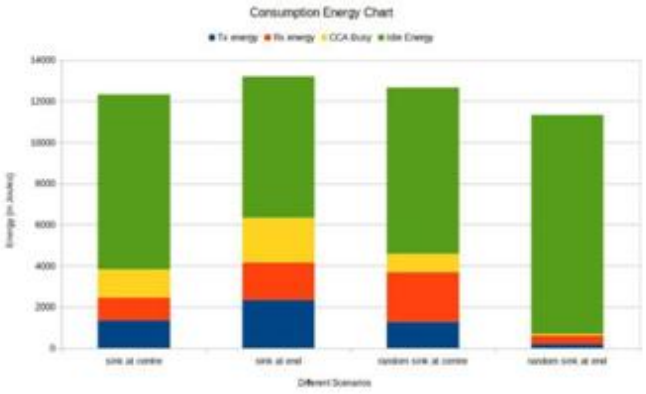
3. PACKET DELIVERY RATIO

The ratio of deliver packet which is send by the source node and received by the destination node.

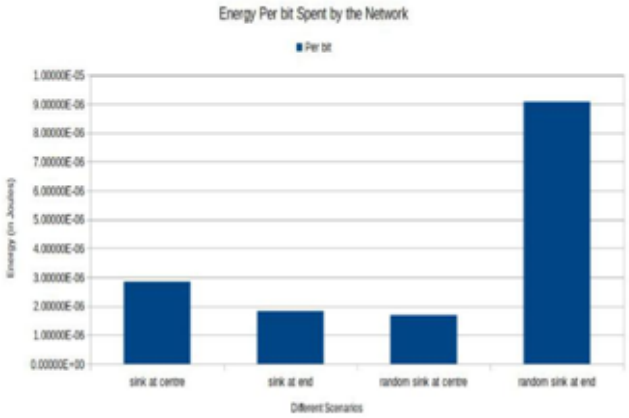
A) Energy consumption chart:



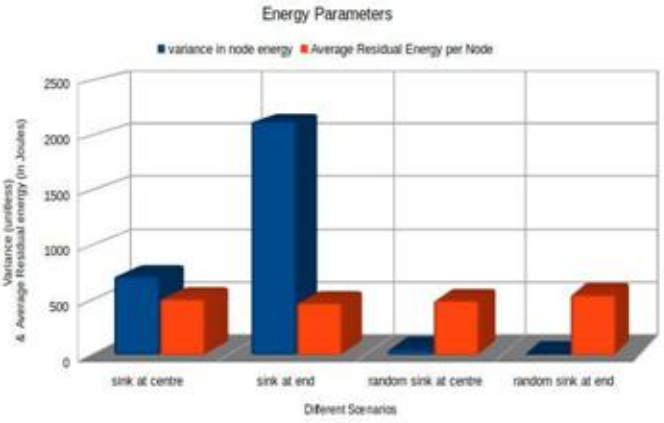
B)consumption time chart:



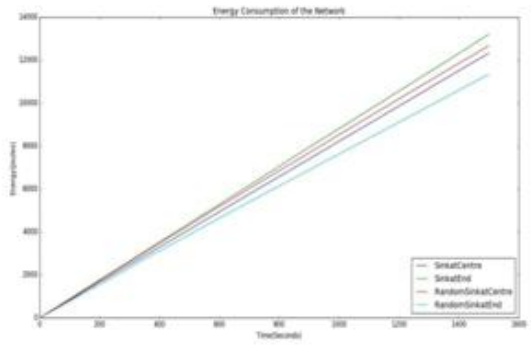
C) Energy per bit spend by the network:



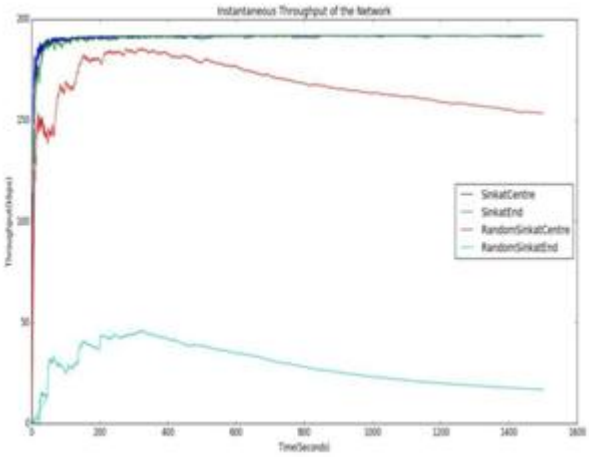
D)Average residual energy:



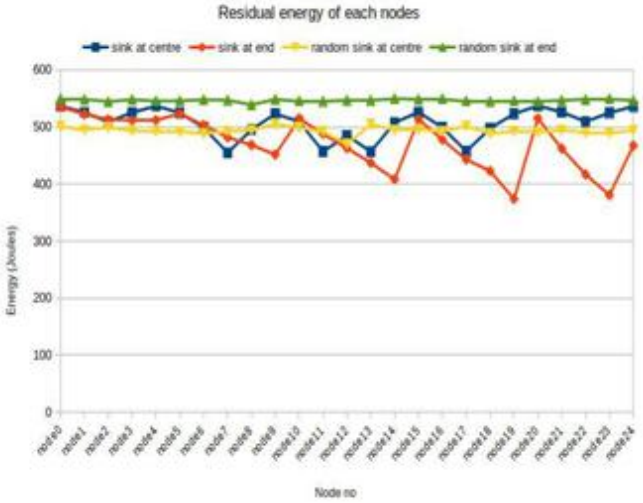
E)Energy consumption of the network :



F)Instaneous throughput:



G)Residual energy of each nodes:



V.CONCLUSION

In order to maximize the life time of a sensor network, each sensor node must consume its energy resource efficiently. The single sink network design problem where the optimal location for the sink nodes is calculated to have maximum average sink node degree and average hop count in the resultant network. The goal of generatr routes that connect all the source nodes with minimal total path cost under the constraints of packet delay requirements and load balancing needs.

VI. REFERENCES

[1].D.Yang, S.Misra,X.Fang, G.Xue,andJ.Tang, ”const rained relay node placement in wireless sensor networks to meet connectivity and survivability requirements,” in In: IEEE INFOCOM 2008 proceedings, April 2008.

[2].Xu and Weifa liang,” placing optimal number of sinks in sensor networks for network lifetime maximization”, IEEE, 2011.

[3].Yu-chen kuo and shih-chiehlin, ”A fast sensor relocation algorithm in wireless sensor networks”, world academy of science, Engineering and technology, 2009.

[4].Wint Yi poe and Jens B.schmit,"self organized sink placement in large scale wireless sensor networks",2009.

[5].Prerana shrivastava and Dr.S.B.pokle," survey on sink repositioning Techniques in wireless sensor networks", International journal of engineering and Innovative Technology, volume 1, issue 3,march 2012.

[6].S.Dai, C.Tang, S.qiao, K.Xu,H.Li, and J.zhu,"optimal multiple sink nodes deployment in wireless sensor networks based on gene expression programming", in ICCSNA 2010, february 2010.

[7].Wint Yi poe and jens B.schmitt "self organized sink placement in large scale wireless sensor networks", 2009.

[8].Huizhou, Dongliang, Xiaomei Zhang, Honglin yuan,and chen Xu, "A multiple-dimensional tree routing protocol for multisink wireless sensor networks based on ant colony optimization", Hindawi publishing corporation International journal of distributed sensor networks, 2012.

[9].S.Misra,S.D.Hong, G.Xue,J.Tang," constained relay node placement in wireless sensor networks to meet connectivity and survivability requirements," in In: IEEE INFOCOM 2008 proceedings, April 2008.