IMPLEMENTATION OF PROPOSED SCHEME FOR RELIABLE DATA TRANSFER IN WIRELESS SENSOR NETWORKS

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ABSTRACT: **- Wireless sensor networks are a new type of networked systems, characterized by severely constrained computational and energy resources, and an ad hoc operational environment. When we work with a large sensor area network with dense sensors , there are some nodes that has to bear the heavy traffic load then over the time such sensor goes weak and they start losing the packet. This packet loss is bearable up to some threshold value, but as the packet loss exceed this level it disturb the whole network and now any kind of data transfer over this node is not reliable. In this paper author will implemented the proposed a algorithm that will solve the problem of packets lost and improve the reliability of network. The author will implement this algorithm by help of NS-2 simulator.**

Keywords:-Wireless,Sensors,Data Loss,Aggregation, NS-2S.

I. INTRODUCTION

Wireless Sensor Networks have emerged as an important new area in wireless technology. In the near future, the wireless sensor networks are expected to consists of thousands of inexpensive nodes, each having sensing capability with limited computational and communication power [1] , [2] and [3] which enable us to deploy a large-scale sensor network. Wireless sensor nodes have emerged as a result of recent advances in low-power digital and analog circuitry, low-power RF design and sensor technology. Sensor networks are distinct from traditional computing domains. Their Design assumes being embedded in common environments, instead of dedicated ones. As these devices are deployed in large numbers, they will need the ability to assist each other to communicate data back to a centralized collection point. A critical step towards achieving this goal of cooperative mini device is the design of a software architecture that bridges the gap between raw hardware capabilities and a useful system.

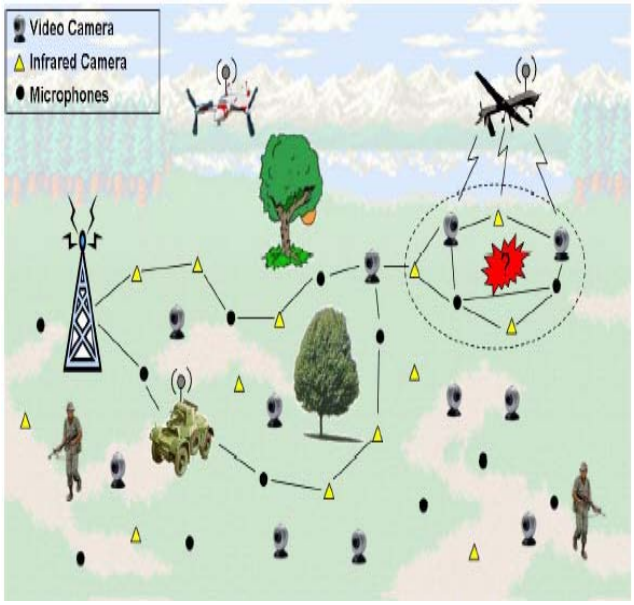

Fig 1 :- Wireless Sensor Network Architecture

1.1 The design of WSN is influenced by many challenging factors. They are following:-

- **Node deployment:** Node deployment in WSN is application dependent and affects the performance of the routing protocol. The deployment can be either deterministic or randomized. In deterministic deployment, the sensors are manually placed and data is routed through pre-determined paths. However, in random node deployment, the sensor nodes are scattered randomly creating an infrastructure in an ad hoc manner.
- **Energy consumption without losing accuracy:** In a multihop WSN each node plays a dual role as data sender and data router. The malfunctioning of some sensor nodes due to power failure can cause

significant topological changes and may need rerouting of packets and reorganization of network.

- **Data Reporting Model:** Data sensing and reporting in WSN is dependent on the application and the time criticality of the data reporting. Data reporting can be categorized as either time-driven (continuous), event-driven, query-driven, The routing protocol is highly influenced by the data reporting model with regard to energy consumption and route stability.
- **Node/Link Heterogeneity:** In many studies, all sensor nodes were assumed to be homogeneous, i.e., having equal capacity in terms of computation, communication, and power. However, depending on the application a sensor node can have different role or capability. The existence of heterogeneous set of sensors raises many technical issues related to data routing.
- **Fault Tolerance:** Nodes may fail due to power failure, physical damage etc. This may require actively adjusting transmit powers and rerouting packets through regions of the network where more energy is available.
- **Network Dynamics:** Routing messages from or to moving nodes is more challenging since route stability becomes an important issue, in addition to energy, bandwidth etc.
- **Transmission Media:** In a multi-hop sensor network, communicating nodes are linked by a wireless medium. The traditional problems associated with a wireless channel (e.g., fading, high error rate) may also affect the operation of the sensor network.
- **Coverage:** In WSN, each sensor node obtains a certain view of the environment. Hence area coverage is also an important design parameter in WSN.
- **Data Aggregation:** Since sensor nodes may generate significant redundant data, similar packets from multiple nodes can be aggregated so that the number of transmissions is reduced.
- **Data aggregation:** Data aggregation is the combination of data from different sources according to a certain aggregation function. Quality of Service: In some applications, data should be delivered within a certain period of time from the moment it is sensed; otherwise the data will be useless. Therefore bounded latency for data delivery is another condition for time-constrained applications.

II. PROPOSED WORK:-

We are representing reliable data transfer over the network in case of a Wireless Sensor Network. To solve this problem the proposed system identify the low power nodes, because in sensor area network it is not possible to track all the nodes always

The proposed work is divided in two phases

1. Locating the Low Energy Node
2. Define it in the list of Block Nodes/Critical Node
3. Find alternate node such that efficiency of system should not degrade and transfer the packets of low energy node through this node.

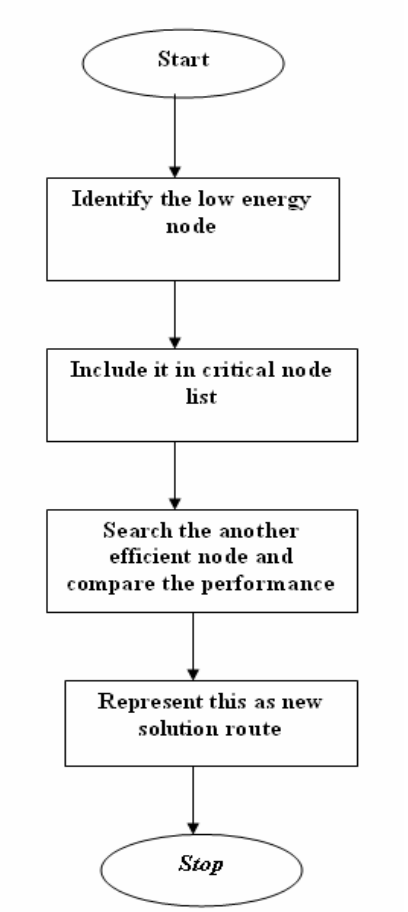

Fig. 1.2 flow diagram

Now the proposed system will be represented as an approach or the framework to resolve the above said problem. These steps are implemented by using NS2.

The proposed algorithm we will use for solve the problem of low power nodes in wireless sensor network. In this algorithm we follow the following step:-

Main Algorithm(S,D)

/*S is the source node and D is the destination node, the network defined is dynamic*/

{

1. Find all the nodes that occur in path between source and the destination. These nodes are representing by NodeList(1 to N).
2. for i=1 to N
3. {
4. if(PacketLoss(NodeList(i))> MAX_THRESHOLD_VALUE)

```
5.      {
6.      find the list of compromising nodes for Node
        NodeList(i). This list is represented by
        Compromising(1 to K)
7.      Select any of the compromising node from this
        list and use it in place of node dropping the data
        packet
        NodeList(i)=Rand(Compromising,1,k)

8.      if K= 0  /* if there is no compromising node*/
9.      {
10.     NodeList(i)=Include New Node
11.     }
12.     }
13.     }

}
```

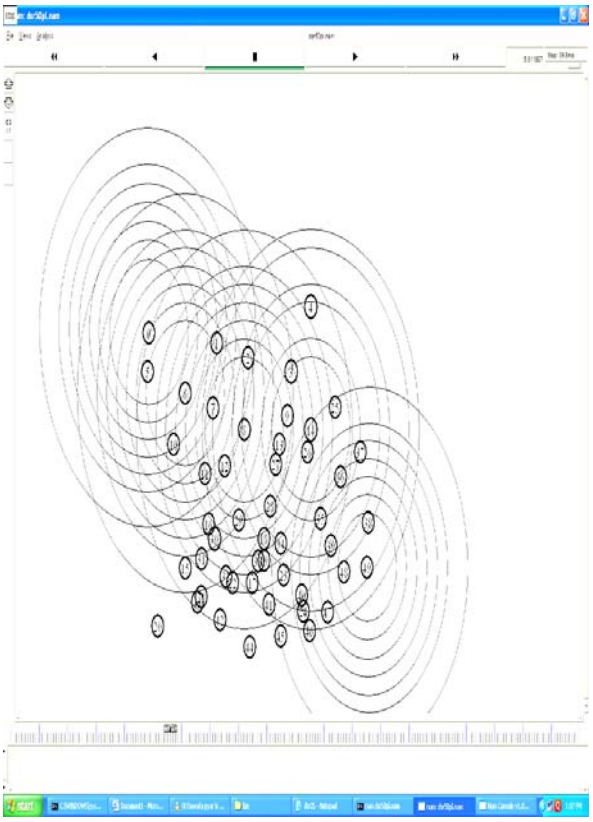

Fig. 2.1 a WSN with 25 nodes

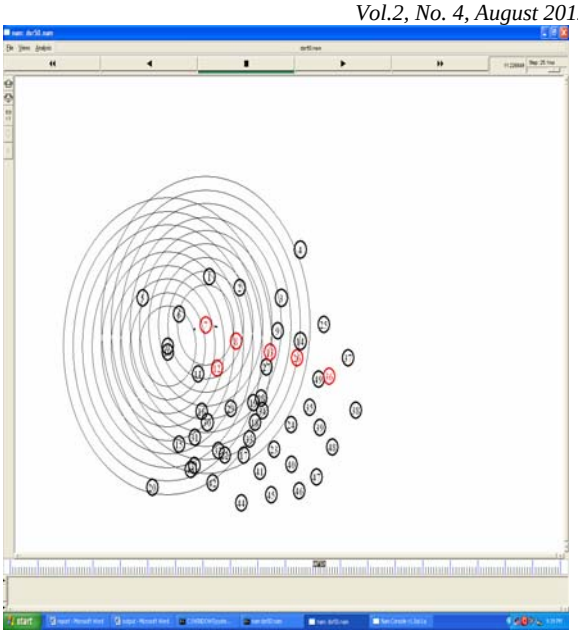

Fig. 2.2. locating of low energy nodes

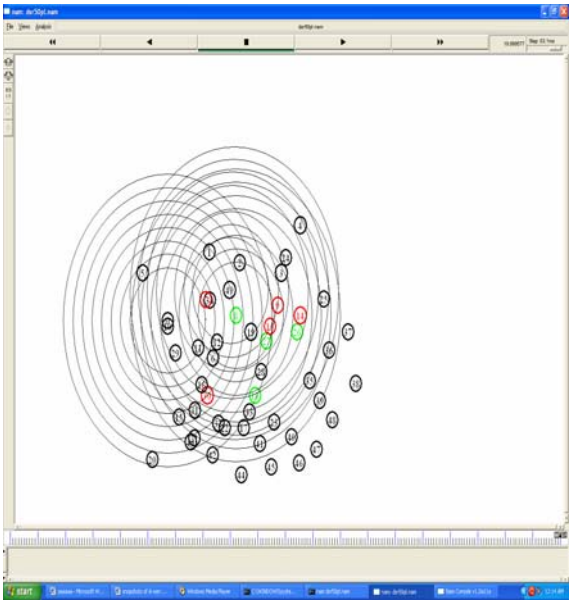

Fig. 2.3 replacement of low energy nodes

COMPARISON OF EXISTING SYSTEM AND PROPOSED SYSTEM

III. RESULT

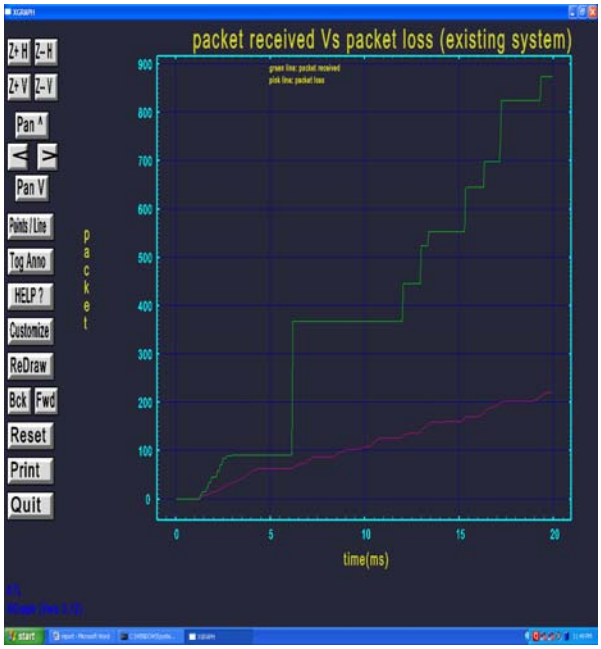

Fig. 3.1 packet received Vs packet loss (existing system)

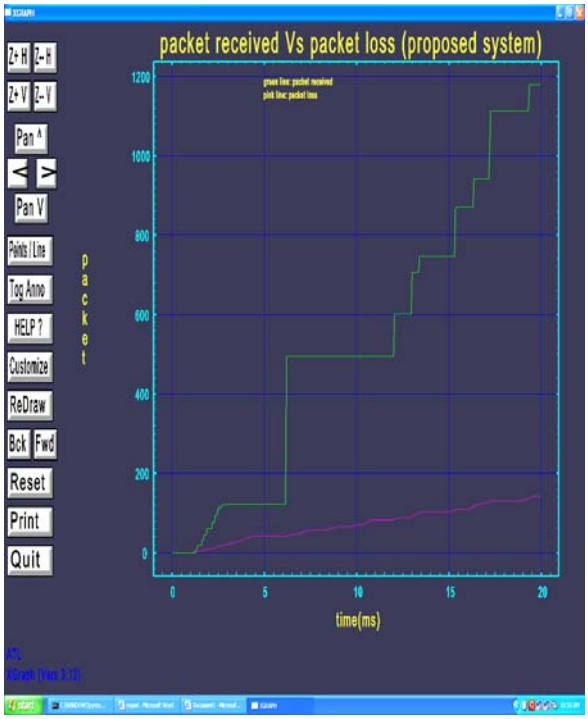

Fig 3.2 packet received Vs packet loss (proposed system)

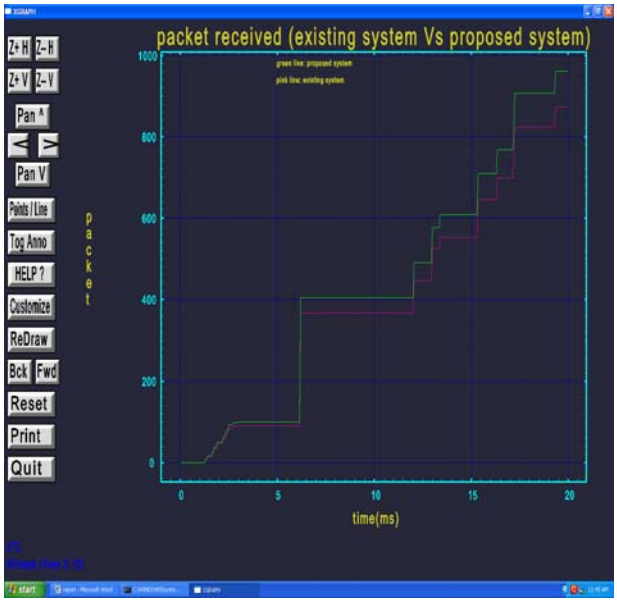

Fig 3.3 packet received (existing system Vs proposed system)

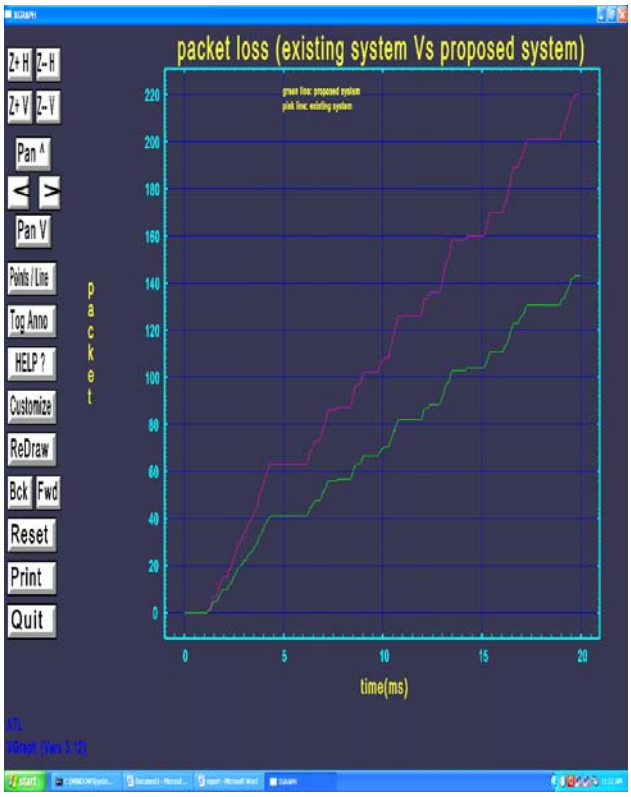

Fig 3.4 packet loss (existing system Vs proposed system)

A WSN WITH 50 NODES

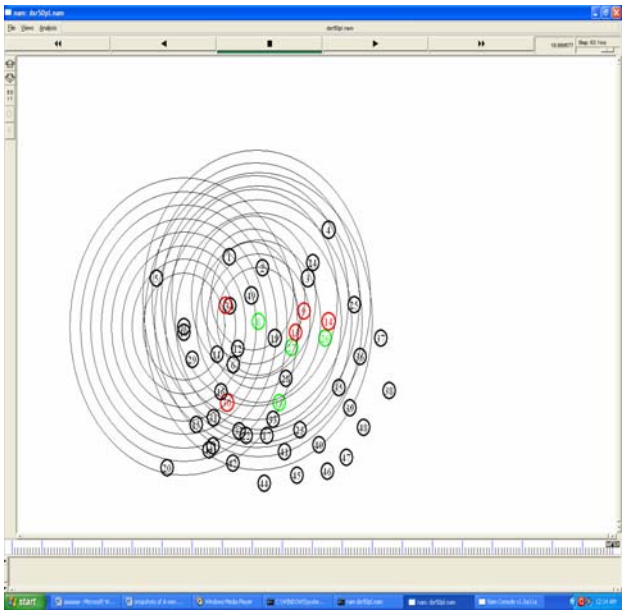

Figure 3.5 replacing all low energy nodes (the nodes which are losing packets) with some other nodes

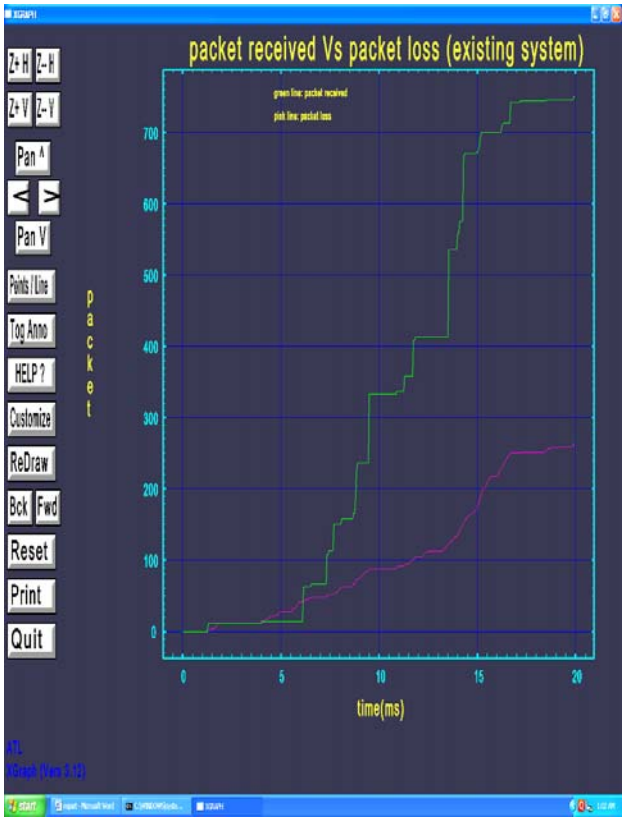

Fig 3.6 packet received Vs packet loss (existing system)

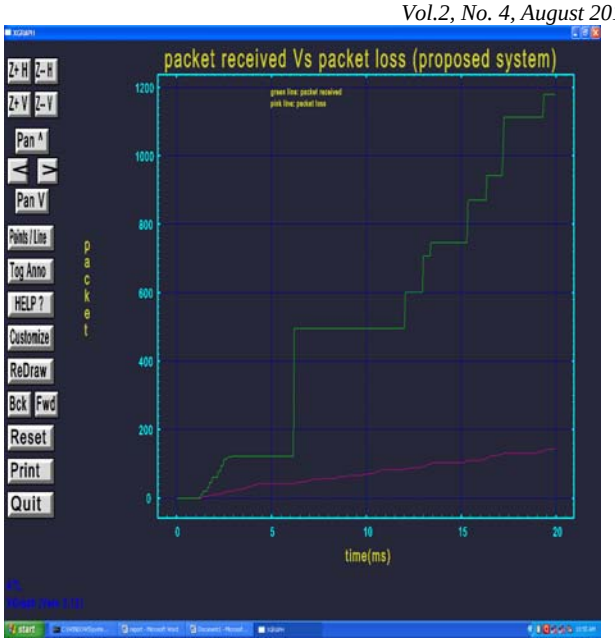

Fig 3.7 packet received Vs packet loss (proposed system)

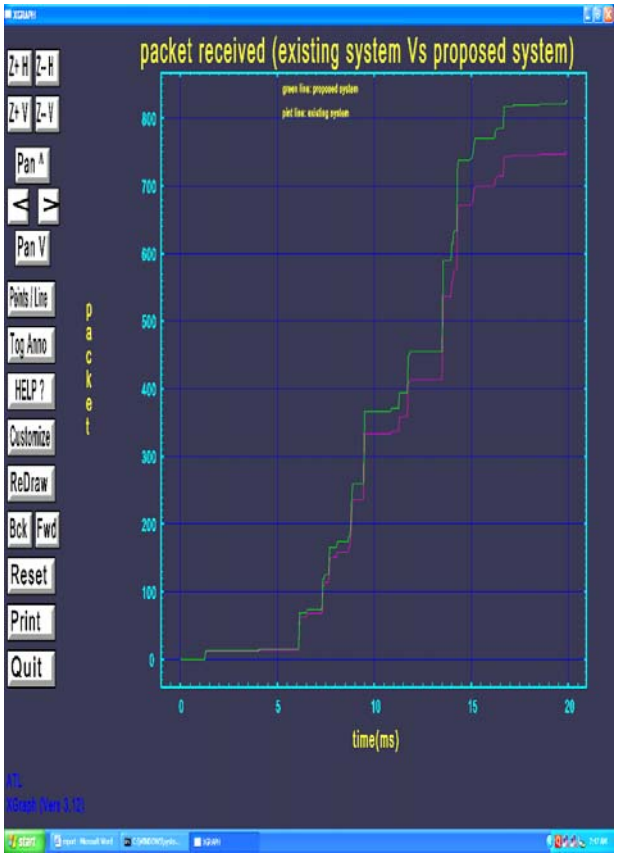

Fig 3.8 packet received Vs packet loss (proposed system)

IV. CONCLUSION

The proposed algorithm is implemented using NS-2 .Then first detects the weak sensor node over the network and then blocks it or set its load to the minimum. Now instead of transferring data on this node, it will be passing on from the surrounding nodes; it will only handle the transmission that is directed to it only. The algorithm provides better solution for handling the packet loss due to low energy nodes (weak nodes) over the network.

V. FUTURE WORK

In this proposed work we defined the whole concept respective to a specific topological representation network. We can enhance our work by using different topological areas. We can also extend it to different kind of network like manet, wimax etc.

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