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A Parameter based Routing for Highly Reliable Data Transfer to Balanced Energy Consumption in WSN's

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ABSTRACT*:* A wireless sensor networks (WSN) are spatially distributed autonomous sensors to monitor physical or environmental conditions, for instance, temperature, sound, weight, and so on, and to cooperatively pass their data through the network to a primary area. The improvement of remote sensor systems was motivated by military applications such as battlefield surveillance, today such frameworks are used as a section of numerous modern and consumer applications, such as modern procedure checking and control, machine wellbeing observing, etc.

KEYWORDS: Mobile sink, sink relocation, Wireless sensor networks (WSNs), energy efficiency Routing.

I. INTRODUCTION

Wireless sensor networks (WSNs) have wide range of practical applications, especially in civil and military environment Wireless sensor networks (WSNs) have wide range of practical applications, especially in civil and military environment they are usually used for periodic monitoring of environment or detection of random events. A wireless sensor network (WSN) is made up of hundreds or thousands of sensor nodes with various sensing devices to observe events in the real world over a geographical area. A sensor node consists of different types of sensors, processing unit, memory, and power supply unit. Each node is associated with limited power supply. Hence, during designing any protocols for WSNs, reducing energy consumption are the major concern. Individual sensors powered using battery can run for only 100-120 hours when A batteries are used and nodes work in active mode. In addition, they might be deployed anywhere, i.e., remote, unattended, or hostile environments. In these situations, it is quite difficult and may not be possible to recharge or replace the battery in the sensor nodes. Therefore, prolonging the life time of WSNs is an important challenge. In spite of the above constraints in WSNs, the data transmission from any source to sink must be performed with high throughput Specially appointed remote systems accept no pre-conveyed foundation is available for routing packets end-to-end in a network, and rather depend on middle person peers. Securing specially appointed directing presents challenges because each user brings to the system their own particular versatile unit, without the unified policy or control of a

traditional network. Many ad hoc directing conventions have been proposed beforehand, however none of the proposals have defined security requirements, and all inherently trust all participants.

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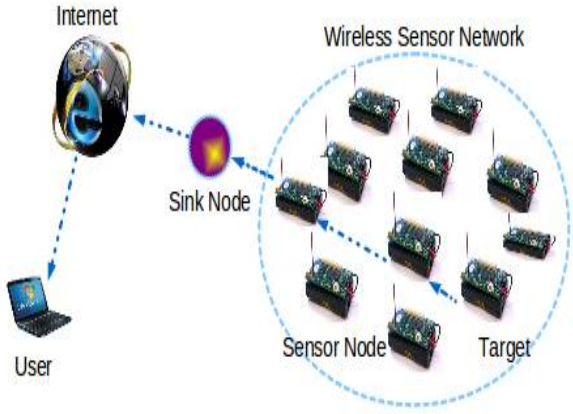

Fig. 1 An overview of WSN

In this paper, we show abuses that are conceivable against ad hoc routing protocols, define various security situations, and offer a protected arrangement with a validated routing protocol. We detail the exploits against two protocols that are under thought by the IETF for institutionalization: the Ad hoc on-demand Distance Vector routing protocol (AODV) what's more, the Dynamic Source Routing convention (DSR). AODV and DSR are efficient in terms of network performance; in any case, they permit aggressors to effectively publicize falsified course data, to redirect routes, and to launch denial of-service attacks. Our proposed convention, Authenticated Routing for Ad hoc Networks (ARAN), detects and protects against malicious activities by outsiders and associates in one specific promotion hoc environment. ARAN introduces authentication, message honesty, and non-disavowal to a specially appointed environment as a part of a minimal security policy. Our evaluations show ARAN has insignificant execution costs for the expanded security in terms of processing and networking overhead. Wireless sensor networks (WSN).

II. LITERATURE SURVEY

MAC and routing protocols in WSNs have two major aspects, network structure and protocol operation. Network structure is basically of two types, viz. (i) flat structure and (ii) hierarchical structure. In flat structure, all distinct nodes do not play a distinct role. Evolution of clock synchronization protocols based on flat structure has been in the form of flooding, directed diffusion.There are many existing MAC or routing Protocols which are based on the hierarchical structure. The hierarchical structure is intended to improve the network in terms of scalability and efficiency. In this kind of structure, nodes have different roles as per their position in the network. There are many existing MAC or routing protocols which are based on the hierarchical structure in which a node is put into sleep mode or active mode depending upon its sensing area. Here, the sink node generates a tree structure by using the breadth first search. The configured topology is prepared for each re-configuration period, which depends upon the remaining energy of the sensor nodes. During each period, the information collected by the active nodes should be sent to the sink node. As sensor nodes are randomly deployed in a region, and the position of nodes is known using GPS by periodically running the dynamic sleep scheduling algorithm at sink node, one can decide whether a node should be put to sleep or active mode. But, in this approach, when a node dies out in the middle of time period, the routing structure would get disturbed and the area remains un-covered. As an alternative solution, one can go for re-configuration as soon as possible but this would again involve high overhead. An energy aware routing protocol, in which the protocol typically tries to find the minimum energy path to optimize energy consumption and long term network connectivity on top of a tree structure. The protocol ensures that connectivity in the network is maintained and the energy level of entire network should be nearly the same everywhere. Energy aware scheme proposed in the protocol maintains a set of lowest energy path and chooses different paths at different times based on their remaining energy, so that a network hole is not created in any path. To start data transmission, a node shows a wakeup signal in the chose way.

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III. PROPOSED SYSTEM

As described earlier, Path Parameter is a key parameter to make a decision during routing. Path Parameter is formally defined as

Path Parameter = $\alpha \times WL + \beta \times WE + \gamma \times W\phi + \lambda \times WH$ (1)

α ,β,γ and $\lambda$are coefficients denoting the significance of each factor. All coefficients take their value in the interim [0, 1]. Additionally, the whole of the coefficients must be equal to 1. Set any of them to be zero, the corresponding component is no longer considered. So, PBRR can have variant configurations depending on application and one can choose a appropriate arrangement set to fulfill his/her particular requirements

The factor W is calculated by:

$$WL=\text{path reliability}=\prod_{i=1}^{\text{hop count}}(1-LERi) \quad (2)$$

A distributed algorithm for constructing a tree structure. This structure would be suitable for developing only the MAC or routing protocols which are designed on top of any hierarchical structure.

. In order to increase the system lifetime and to lessen the retransmissions due to the frequent path breakdowns, it is necessary to select a way which comprises of the sensor hubs with more leftover vitality.

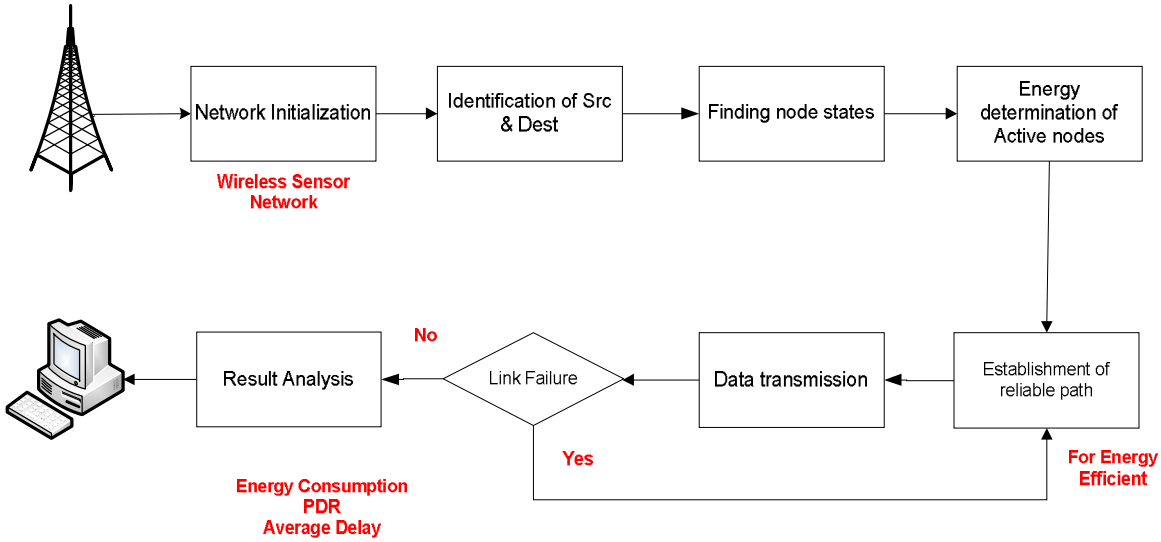

Fig 2: Architecture of proposed system

A. SOURCE AND DESTINATION ROUTE ESTABLISHMENT

Here the data packets are transferred from source and destination to select source and destination for transferring Information from source and destination. And these nodes can be selected from users dynamically.

Each label (route request packet) conveys the data of target source ID, 'Way information' (onto which the intermediate nodes piggyback their IDs), and Path Parameter parameters. These parameters include: 'Hop Count', 'Min Energy', 'Path Reliability', and 'Min Free Buffer Size'. The steering choice is made in light of these parameters. As the routing decision is a function of these parameters, it will formally define how to calculate the value of the Path Parameter by using PBRR algorithm. Thus the node simply discards the received label. Therefore, PBRR provides an energy sufficient path instead. Thereafter, the node decides to transmit or discard

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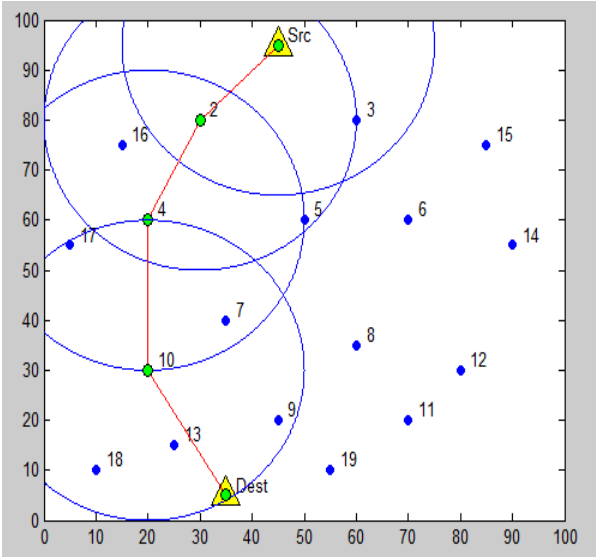

Fig 3: Performance Evaluation

B. PERFORMANCE EVALUATION

The proposed clustering algorithm is simulated by MATLAB. First we evaluated efficiency in energy consumption, second we evaluated reduced delay in data communication and finally we calculated packet delivery ratio

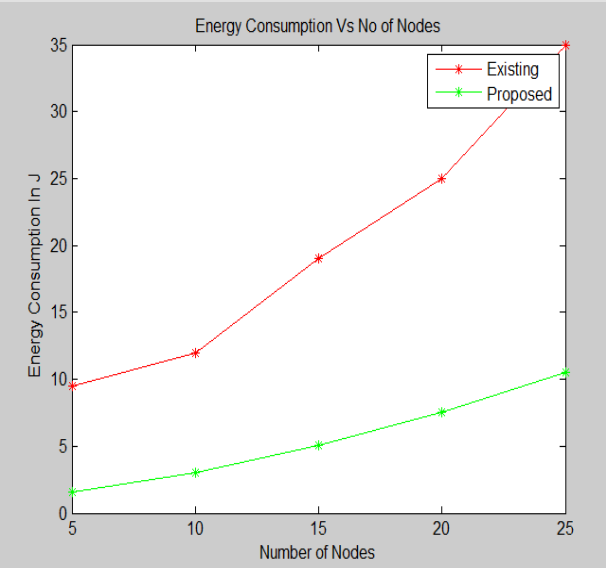

Fig 4: Energy consumption

The above snapshots shows that the average energy consumption in the construction of hierarchical structure is quite less as compared to that in the existing approach. So, with progress in the number of rounds, the difference of average remaining energy in these two approaches also increases. This indicates the life time of WSN using the proposed approach is more than that using the existing approach.

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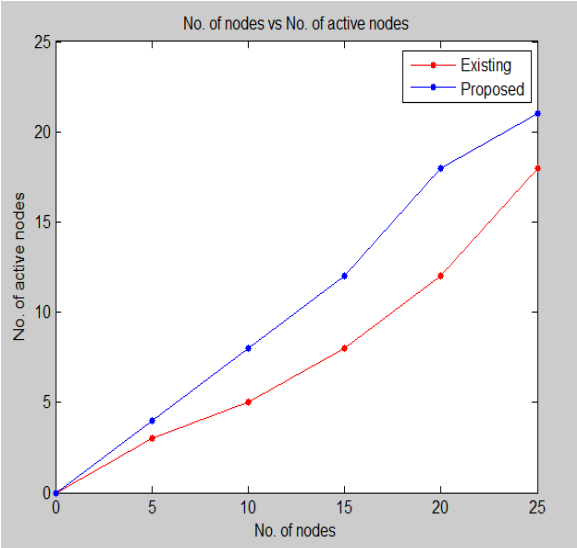

Fig.5: Number of alive nodes

The above snapshots show the number of active nodes in different size WSNs using the proposed approach and existing approach. It is to be noted that with increase in network size, the difference of number of active nodes between these two approaches also increases. It is also found that the number of active nodes in the proposed approach is always greater than that in the existing approach for different size of WSNs

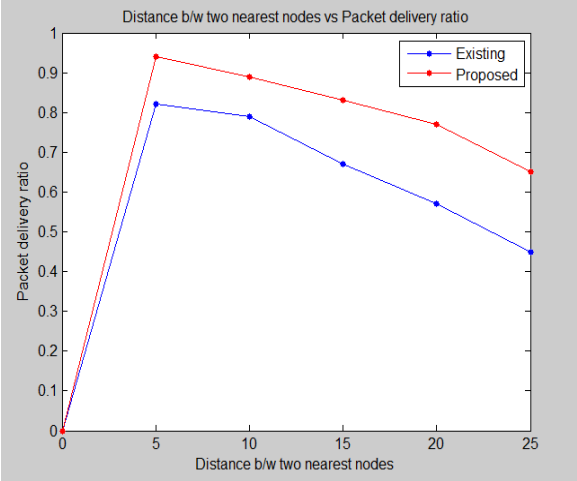

Fig 6: Packet delivery ratio

The snapshot shows that the ratio of packets that are successfully delivered to a destination contrasted with the quantity of bundles that have been sent out by the sender. The ratio of the number of delivered data packet to the destination. This illustrates the level of delivered data to the destination.

IV. CONCULSION

A distributed approach for constructing Hierarchical structure and a routing protocol on the top of the proposed hierarchical structure that incorporate bsleep scheduling to prolong the network lifetime .In this paper Nodes are deployed in the networks .where he nodes are deployed in the networks .where the nodes are identified with source and

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destination to transmit the data packets with the shortest path which is reachable within the less time. Data will be encrypted for security purposes once the data is encrypted no hacker can hack the data. If the malicious node is detected then the packets will be jammed so it finds the alternative path to transfer the packets so to check whether the nodes are active transmitting the data packets in the shortest path will consume energy and life time and there will be no packets delay. Reliable path is established for every efficient .the data is transmitted form source to destination. If the link failure the packets will be dropped. The protocol is dynamic enough to handle failures such as node failure or network hole by maintaining multiple parents and balancing energy consumption at each node in WSNs.

Although distributed approach is more efficient and less time consuming as compare to sequential approach, for further improvement we can use multi-sink, so that data transmission from any source to sink will be faster, which we have taken as our future work. Future work also includes validating the performance of the protocol with proper theoretical analysis.

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