ENERGETIC ROUTING TECHNIQUE USING LATENCY WISE PROMOTE NODE SELECTION ALGORITHM IN WSN

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ABSTRACT:

A wireless sensor network consists of spatially disseminated independent devices using sensors to jointly monitor environmental conditions, such as temperature, noise, vibration, pressure, motion or pollutants.The WSN contains a huge number of sensor nodes.These nodes are battery powered, The power efficiency of the sensors is also crucial .Due to this the network routing process is performed based on two states namely sleep and active state. In some critical circumstances low energy nodes go to active state and perform communication processes.Some sensor nodes suddenly lose energy causing communication failure.This increases energy consumption, network overhead, and end to end delay. Hence the proposed Energetic routing Technique (ERT) is used to obtain the energy efficient communication in wireless environment.This ERT efficiently monitors the low energy nodes and provides the high energy neighbor node list for further packet forwarding in sensor network and Constructing the Latency wise promote node selection algorithm is applied to remove maximum delay node, also choose lesser delay node for packet forwarding. Therefore it reduces the energy consumption, network overhead, and end to end delay.

Keywords: *Energy,Sensor nodes, Energetic routing Technique, Latency wise promote node selection algorithm.*

I.INTRODUCTION

In the WSN-Wireless Sensor Network is construction of many nodes, where each node is linked with other sensor nodes in the network. The sensor node is generally tiny, lesser weight, and convenient. Wireless sensor network has some problems which concern the entire characteritics of the sensor nodes in network environment, these problems are restricted by energy level, scalability, failure management, protection, limitation of resources [1]. The wireless network is arrange with various sensors nodes capable minimum energy, coverage, lesser storage space. The sensor structure are separated into various sectors, each sector having a set of sensor nodes in network. The sender node need to transmit inquiry request to intermediate nodes in the destination location to collected data packet among the predefined network structure. Though, the wireless network has restricted environment, consequently, every sensor node has whole tasks of observing, and transmitting data packets [2].

A sensor node collects the data packet with the sensor network topology and transmit data packet to a nearest neighbor node or directly broadcasted to the sink node. The wireless nodes contains many sectors such as communication division, resource availability division, and process observing division [3]. The resource availability division is vital in a sensor network, since a tensed sensor network is expensive and latency for fixing those kind of nodes. The communication division proceeds the packet sharing between sensor nodes in the network [4]. For convert forwarded bits into coverage range, it necessary for the construction of communication division. Generally sensor nodes have restricted energy level, the sudden energy loss in nodes cause the communication failure. This process to manage the sensor node perform packet transmission, which are linked to perform communication process. Sensing in network node used for temperature, disaster measurement process [5].

Remaining section of the paper is designed as follows. Section II provides related works. In Section III, provides the details of the proposed Novel Protected Communication (NPC) scheme, to discover the trusted routing path over selfish attacker node present in the network. The The node reward with trust level evaluation algorithm is designed to maximum trust level nodes for communication process. Section IV provides simulated performance results analysis obtained under various metrics. At last Section V concludes the paper with future work.

II. RELATED WORKS

Kumari, R., et al., [6] proposed technique have a hybridization of routing scheme. The routing scheme is applied for path and ad hoc routing protocol is used for store data packets. In the directional transmission smart transmitter network is used. The smart transmitter simply used to broadcast the data packet in the route of the target node, so extra communication overhead is minimized, and individually to routing node are energetic others are inactive state, therefore minimum energy usage in the network. In additional a genetic scheme and ant colony optimization is used in the time allocation routing technique that indicates the valuable efficient routes. The simulation result is minimum communication overhead, and improved throughput.

Ashish, A., et al., [7] wireless nodes are fixed in negelected area. For the condition of boostup the batteries else altering the batteries is very difficult one. Consequently, the improving the network lifetime is vital aim for optimal path discovery process. Communication techniques are appiled to transmit observing the data from network area and forward these data packet to sink node proficiently. Datacentric method is vital one to proceed the data packetrganization process to obtain the energy-efficient broadcasting. The evaluation on different previous method are distinguished on different metrics such as velocity of node, energy usage of node, communication rate.

Jiaying, D., et al., [8] proposing an energy-efficient many route communication technique is appropriate for constricted strip area along the sequence of nodes in the network. For this method, Single pace node packet sharing, and dual pace

node packet sharing are constructed to forward data packets with various possibility rane, so that packets with maximum possibility of packets are broadcasted with minimum hop nodes for maximum effectiveness. Communication blocking of this scheme is extra increases the strength of the network perform,ance. Experimental output show the authority and possibility of this many route communication technique.

Patil, S. S., et al., [9] Presenting the system Metrics depending trustworthy Routing scheme, applys an quantity of nodes, energy of node, space difference of nodes, is used to discover previous nodes in ranking environment. Lifespan of network is distinct as the time taken of network communication process, awaiting the primary sensor node. Sleep-wake preparation is an effectual technique to improve the lifespan of these energy-constrained network structure. This method is used to discover a small and dependable route among sender and target node by minimizing the energy usage, packet latency, also enhances the throughput rate.

Ait Aoudia, F., et al., [10] Techniques is generic framework for modeling MAC protocols. This framework can be used to evaluate recent MAC paradigms, evaluation of the novel pure-asynchronous approach, this approach scheduling the packet transmitting, and packet receiving time. The process is enabled by emerging particularly minimum energy wake-up acceptor nodes. The emerging particularly energy wake-up acceptor nodes suddenly loss energy makes communication failure. It increases energy consumption, because the one node failure need to break the communication process, and drop the data packet. Retransmission makes the maximum network overhead, and end to end delay is increased, since more latency occurred for packet transmission path.

III.OVERVIEW OF PROPOSED SCHEME

In the wireless sensor network are used for sensing process in the various application environmental monitoring, and healthcare observation. Sensor nodes are always steady in nature, these nodes are constantly deployed in specific location. The energy level of each sensor nodes are vital one for node working condition. In network communication procedure is executed depends on two modes, are inactive and energetic state. Whether some critical condition the minimum energy nodes are sometimes go to energetic state and proceed packet sharing, and this node is suddenly drop the energy level, which makes packet transmission breakdown. It improves the energy usage, network overhead, and packet latency.

Then, proposed Energetic routing Technique (ERT) is applied to provide the energy efficient packet transmission in wireless environment. Unexpectedly awaken by low energy nodes are observed efficiently by using this ERT, and achieve the maximum energy level of neighbor node list for more packet sharing along the sensor network. Designing the Latency wise promote node selection algorithm is used to reject the higher delay node, also select lower delay node for communication process. This minimizes the energy usage, network overhead, and latency.

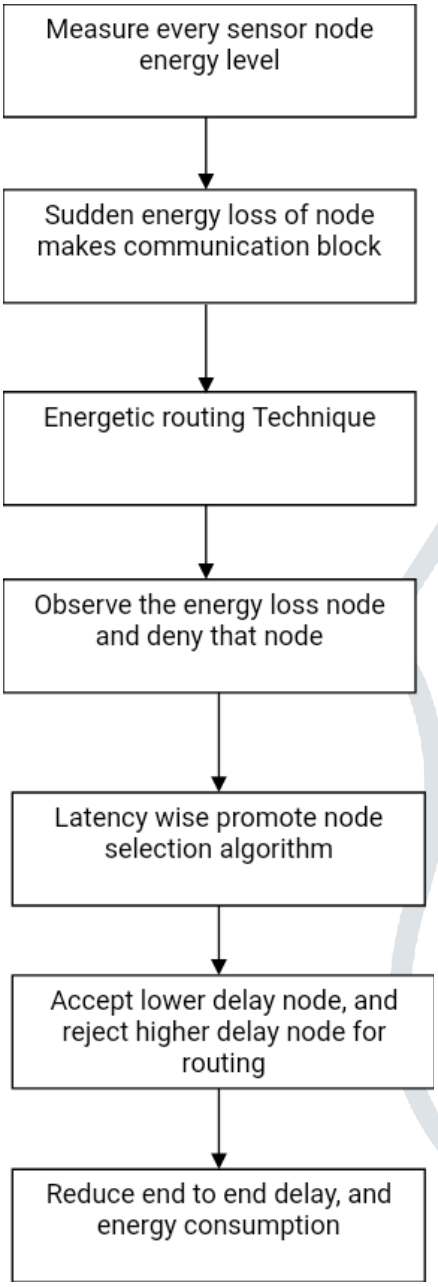

Figure 1: Block Diagram of Proposed Energetic routing Technique

Figure 1 shows the Energetic routing technique. To measure the each and every node energy level, if critical situation low energy nodes are active for long communication, they loss energy suddenly cause communication failure, to overcome this by using energetic routing technique. Latency wise promote node selection algorithm is designed to separate the lower delay node, higher delay node. This minimizes the packet latency, and energy consumption.

3.1 Measure every sensor node energy level

Every nodes allows an transmitted packet to its every neighbour nodes does not knowing ability of every nodes. This can carry on this process awaiting the more quantity of hop nodes for the packet transmission is achieved otherwise awaiting the packet reach its target node. Though, this scheme has some disadvantage such as communication overhead. This is same as in node dropping data packet, except its choose particular neighbour node arbitrarily from neighbouring routing table based on the node ability, this choosen node broadcast data packet to next random choosing relaying node and subsequently. Sensor node energy level is measured sequencially during communication time.

The network framework effort to transmitting data packet by selecting a suitable routes that provide better throughput based on the energy usage and packet success rate. The framework have one disadvantage in network process, and aim of recent method. Subsequent to review the monitoring of node energy level, that there is no efficient output that obtains the maximum transmission rate, and lesser communication overhead. This process makes only alteration path are used to performed and to minimize the energy usage. Network model is used to remove the restriction of node energy level, this are cause problem also node gets dead, that dead nodes are the sensor nodes that can drop the energy further some time, for communication process.

3.2 Energetic routing technique

The wireless connection between the various sensor nodes that supports to decide the route for data forwarding. Packet sharing based on the connectivity of nodes are does not generated among, some of the sensor nodes as they does not drop in the packet, communication range of the wireless node as energetic routing scheme. The network is predetermined and the shortest distance route for data packet forwarding is determined in this technique.

Energetic routing technique is used to discovers the uses connected to smart node, where real time data packet observation is essential. The low energy nodes are rejected, to manage the traffic

in the network needs fast data broadcasting, and therefore minimum space route for communication is appropriate. As the source node and the destination node are deployed, the route of hopping is established from the sender node to the target node. Energetic routing protocol goals at practical routing is one of the most frequent scheme.

The route for communication using node energy Level Based Routing scheme follows ranking based nearest neighboring node choosing procedure to discover the nodes at the various energy levels of nodes. Beacuse target node data collection process is the primary function of sensor networks, an energy level based routing technique is constructed to share data packet in conditions of energy level of node. In this technique, the discovering of the route initiates from source node to the target node. The nearest node to the target node in the similar energy level is selected as the existing node from which data packet is observed. Correspondingly, the process is repeated from the nearest neighbor node select turn over the source node to decide the whole route.

Algorithm for Energetic routing technique

Step1: The nodes are fixed stable in network structure

Step 2: for each node discover energetic node

Step3: Sender node forward data packet to nearest neighbor node

Step 4: $if\{Path == energetic\}if\{Path == energetic\}$

Step 5: Nodes are share packet towards to target node

Step 6: $else\ if\{Path! = energetic\}else\ if\{Path! = energetic\}$

Step 7: communication failure

Step 8: End if

Step 9: End for

3.3 Latency wise promote node selection algorithm

Improve the energy efficiency of intermediate node selection scheme by evaluating the node predictable value of the space between the best node and every neighbor nodes, this can use more energy on the lesser delay node selection process, when the amount of neighbor nodes is huge. The energy efficiency of wireless network routing based on the significantly, to initiate a node to failed the intermediate nodes consider as maximum delay nodes, and to select an energy efficient packet transmission success path.

Latency wise promote node selection algorithm is designed to separate the maximum delay node, and minimum delay node. The higher delay node is not allowed for routing, and only allow lesser delay node, these nodes are called as promote node. To design the energy efficient routing path. It improves network Lifetime, and minimizes energy consumption, end to end delay.

Latency wise promote node selection algorithm

Step 1: Estimate the node delay range of routing process

Step 2: for each node construct path

Step 3: $if\ \{node\ delay\ == min\}if\ \{node\ delay\ == min\}$

Step 4: These nodes are chosen for communication

Step 5: $else\ if\ \{node\ delay\ == max\}$
$else\ if\ \{node\ delay\ == max\}$

Step 6: reject that nodes for path construction.

Step 7: end if

Step 8: Reduce energy consumption

Step 9: End for.

VI. Performance Evaluation

A. Simulation Model and Parameters

The proposed ERT is simulated with Network Simulator tool (NS 2.34). In our simulation, 100 mobile nodes move in an 820-meter x 620-meter square region for 20 milliseconds simulation time. Each sensor node goes random manner among the network in different speed. All nodes have the same transmission range of 250 meters. CBR Constant Bit Rate provides a constant speed of packet transmission in the network to limit the traffic rate. DSDV Destination sequenced distance vector routing protocol is used to provide energetic routing path.

Simulation Result: The proposed Energetic Routing Technique (ERT) is used to provide energetic routing path is compared with existing GFM [10]. Latency wise promote node selection algorithm select the lower delay node. It reduces end to end delay, and increases packet delivery rate.

Performance Analysis

In simulation to analyzing the following performance metrics using X graph in ns2.34.

End to End Delay: Figure 2 shows end to end delay is estimated by the amount of time used for packet transmission from the source node to destination node, each node details are maintained in the routing table. In proposed ERT method end to end, the delay is reduced compared to Existing method GFM.

$$End\ to\ End\ Delay = End\ Time - Start\ Time$$

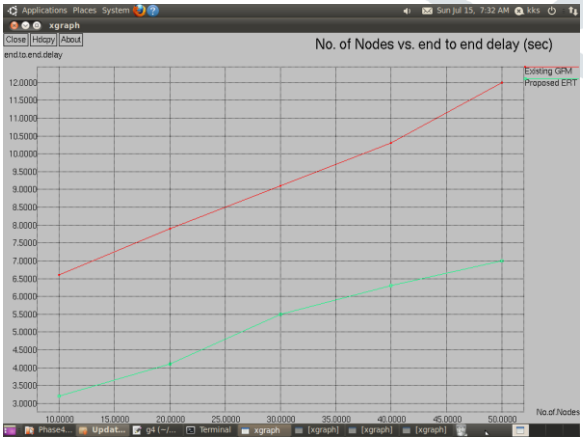

Figure 2: Graph for Nodes vs. End to End Delay

Packet delivery ratio: Figure 3 shows Packet delivery ratio is measured by no of received from no of a packet sent in particular speed. Node velocity is not a constant, simulation mobility is fixed at 100(bps). Latency wise promote node selection algorithm is designed to choose lesser delay node for routing. In proposed ERT method Throughput rate is increased compared to existing method GFM.

$$Packet\ delivery\ ratio = (Number\ of\ packet\ received/Se$$

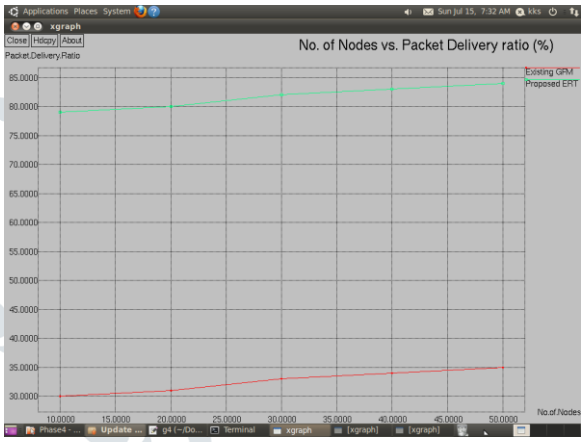

Figure 3: Graph for Nodes vs. Packet Delivery ratio

Network Lifetime: Figure 4 shows that Lifetime of the network is measured by nodes process time taken to utilize network from overall network ability. In proposed ERT method link connectivity is established, so network Lifetime is improved compared to existing method GFM.

$$Network\ Lifetime = time\ taken\ to\ utilize\ network/over$$

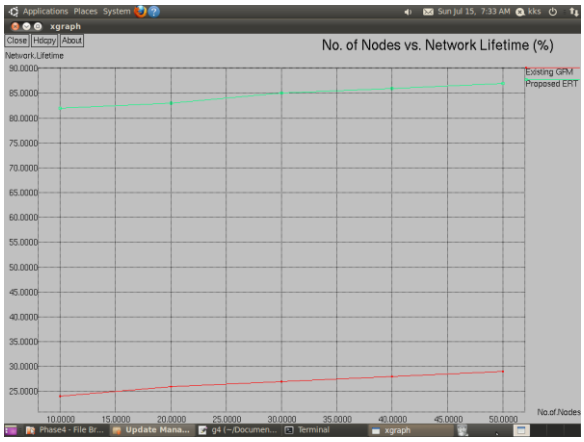

Figure 4: Graph for Nodes vs. Network Lifetime

Energy Consumption: Figure 5 shows energy consumption, how extended energy spends for communication, that means estimate energy consumption starting energy level to ending energy level. In proposed ERT method achieve delay free energetic routing in network, energy consumption is minimized compared to Existing GFM.

$$Energy\ Consumption = Initial\ Energy - Final\ Energy$$

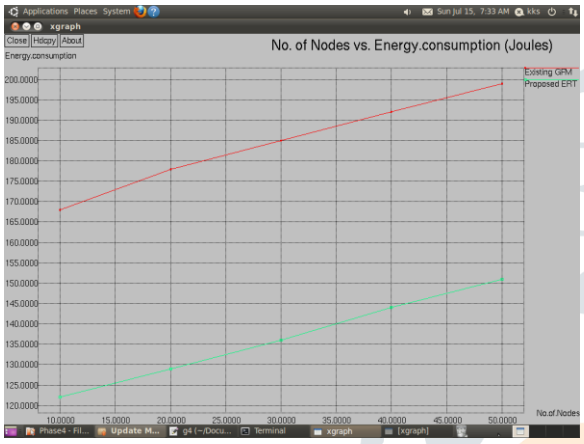

Figure 5: Graph for Nodes vs. Energy Consumption

V. CONCLUSION

In general wireless network, The ultra-low power wake-up receivers nodes suddenly loss energy makes communication failure. It increases energy consumption, because the one node failure need to break the communication process, and drop the data packet Retransmission makes the maximum network overhead, And end to end delay is increased, since more latency occurred for packet transmission path. Proposed an Energetic routing Technique (ERT) is used to obtain the energy efficient packet transmission in WSN. Critical condition this method only use maximum energy node for wake up process, and proceed communication. Latency wise promote node selection algorithm is constructed. This algorithm selects the lesser delay node, and reject the higher delay node for routing process. It reduces the energy consumption, higher energy nodes are active for communication. The network overhead, since nodes does not block packet forwarding. And end to end delay is reduced, packets are successfullt transmitted, and received withn allocated time slot. In future work focus unpredictable link failure detection method to analyze various parameters.

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