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A NOVEL APPROACH TO PREVENT DATA LOSS IN RADIATION AFFECTED AREA

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Abstract - *Wireless sensor network (WSN) is one of most essential network technology which is widely adopted and applied in recent monitoring and control applications. With this network the wireless nodes are communicating using multi-HOP options. In this network the key issues are targeted the life time and fault node discovery and recovery technique is investigated and a new feasible and efficient solution is developed. Where the Partition Detection and Recovery Algorithm PADRA algorithm is applied to find the lost node information and repair the route using the proposed routing technique. The proposed routing technique involves a new technique to discover and recover the routing path efficiently. There for a new routing technique with master and slave technique is provided in this study.*

Key Words: WSN, HOP, Partition, Recovery Algorithm, PADRA. etc.

1. INTRODUCTION

The Wireless sensor network is a collection of sensors that are spread over large geographic regions. As the sensors are hugely spread and enormous in numbers, the possible occurrences of faults in the network are also much more as a fault surface increased. So, to detect the faulty node and to replace the faulty node an efficient algorithm is proposed. Besides the sensors have many issues related to energy, routing, security, coverage, energy etc., and so the proposed efficient detection and replacement algorithm take these issues into account and performs the fault detection and recovery mechanisms. Failures are unavoidable in Wireless Sensor Networks due to the lack of monitoring and unattended deployment. There are many issues related to energy, memory and computational ability of a sensor node. The occurrences of faults are mostly due to the presence of faulty sensor nodes . To identify a faulty node and to replace it, many techniques are proposed. A wireless sensor network operates in a critical environment, and also with limited computing and sensing capabilities capable of sensing, computing and wirelessly communicating.

The wireless ad hoc networks such as mobile ad hoc network and wireless sensor networks are frequently uses the on demand kind of protocols. The main advantage of these routing protocols, these are establishing the routing path when it desired. Therefore, it is lightweight and efficient in working, due to less information stored in routers and they preserve the battery or other computational resources due to less periodic updating processes. Therefore, Most of the adhoc on demand routing protocols is working on two different phases, in first phase using the control message exchange the route discovery is performed. Using this discovery a number of paths between source and destination is obtained by routing protocols. After that the routing protocol decided the most appropriate route and uses the selected path for transmitting data. During mobility the nodes move independently in random manner and in any direction. Thus, if the existing route of communication is abandoned due to mobility and energy, the routing protocols are tries to recover this path using route maintenance. If the route is recoverable than routers repair the previous route and enable the communication and if it is not, then route discovery process is again initiated for new route discovery.

Therefore, it is required to improve the performance during the path break conditions and recovery of both options. In Wireless Sensor Network all sensor nodes have the equivalent probability to fail and accordingly the data delivery in sensor networks is inherently faulty and unpredictable. Most of the sensor network applications need solid data delivery to sink instead of point-to-point unwavering quality. Subsequently, it is basic to give fault tolerant techniques to distributed sensor network applications. Failures are unavoidable in Wireless Sensor Networks because of the absence of monitoring and unattended arrangement. There are numerous issues

identified with energy, memory and computational capacity of a sensor node. The occurrences of faults are mostly due the presence of faulty sensor nodes . To distinguish a fault node and to supplant it, numerous techniques are proposed. The main test in wireless sensor network is to enhance the fault tolerance of every node furthermore give an energy productive fast data routing service. Fault management for WSNs is not the same as traditional networks. Late research has built up several schemes and techniques that arrangement with distinctive types of faults at diverse layers of the network.

2. LITERATURE SURVEY

Fault node recovery (FNR) Algorithm[1] to enhance the lifetime of a wireless sensor network (WSN) when some of the sensor nodes shut down, either because they no longer have battery energy or they have reached their operational threshold. The algorithm is based on the grade diffusion algorithm combined with the genetic algorithm. Using the FNR algorithm can result in fewer replacements of sensor nodes and more reused routing paths. Thus, the algorithm not only enhances the WSN lifetime, but also reduces the cost of replacing the sensor nodes. Data aggregation is an essential paradigm for energy efficient routing in energy constraint wireless sensor networks[2]. The complexity of optimal data aggregation is NP- hard. Ant colony optimization system, it's basically population-based algorithm that, provides natural and intrinsic way of exploration of the search space in optimization configuration settings in determining optimal data aggregation method. The simulation technique results show improvement in energy efficiency depends on the number of source nodes in sensor network, which is 45% energy efficiency using optimal aggregation compared to approximate aggregation schemes in a moderate number of sources whereas 20% energy efficiency in large number of source nodes in the network.

*Ladder diffusion and ACO*An algorithm based on ladder diffusion and ACO(Antcolony optimization)[3] is proposed to solve the major pointing issues of power consumption and transmission routing problems in wireless sensor network scenarios. The defined ladder diffusion algorithm is employed to route paths for data relay and trans- mission majorly in the wireless sensor networks, also with a tendency to reduce both power consumption and time required for processing to create and maintain the routing tables and also avoiding the generation of circle routes in parallel. Another advantage is, to ensure the safety and reliability of data transmission in WSN, their algorithm also provides backup routes to avoid wasted power consumptions and processing time when rebuilding and maintain the routing table in case part of sensor nodes are missing. According to the experimental results, the proposed algorithm not only reduces power consumption by 52.36%, but also increases data forwarding efficiency by 61.11% as compared to the directed diffusion algorithm. This decrease is because the algorithm properly assigns the transmission routes to balance the load on every sensor node .

Directed Diffusion Directed Diffusion for Wireless Sensor Networking Advances in processor, memory, and radio technology will enable small and cheap nodes capable of sensing, communication, and computation[4]. Networks of such nodes can coordinate to perform the work of distributive sensing of environmental phenomena and situations. In this work[4], they explored the directed-diffusion paradigm for such coordination scheme. Directed diffusion is data centric in that all communication is for naming data. The method ensures that nodes in a directed-diffusion-based network is application aware, that basically results in enabled diffusion to achieve energy savings by selecting empirically good paths by caching and processing data in-network (e.g., data aggregation) of sensors. They explored and evaluated the use of direct diffusion in a simple case of remote surveillance sensor network analytically and experimentally efficient. Their evaluation out come is that directed diffusion can achieve significant energy savings and can outperform idealized traditional schemas (e.g., omniscient multicast) under the investigated scenarios.

3. RESEARCH METHODOLOGY

Achieves better energy efficiency and reduced average end-to-end delay compared to the case in which all the sensor nodes have only the acoustic mode of communication. The major limitation of ReDAST is that it requires to have dual mode of communication Affected area. To prevent information loss in WSN due to transfaulty behavior of sensor nodes, in the proposed scheme, we construct the network using sensor nodes having dual mode of communication – RF and acoustic. To get redundant coverage within a radiation affected area, all the sensor nodes in the area become activated and switch to the acoustic communication mode after detecting themselves to be affected by radiations.

4. PROPOSED APPROACH

To find an optimum outcome required to control the issues using the following strategy.

1. *Discover a two nearer path between source and destination*: during initiation of communication the route discovery processed is initiated first, during this source node broadcast the packets in network and using chain reaction technique the destination node is discovered. When the destination node finds the request packet, then it replays with the packets. The first arrived route reply is considered as the shortest path and data is transmitted. Here's a new concept is added to make enhancement, during the route selection, two routes with nearest distance is selected for constructing the repair methodology.

2. *The first path is denoted as the primary and second path is known as a slave:* in this step both the path is labelled as primary and slave. The shortest path is denoted as primary and the next path is termed as secondary. The slave path is a supporting part this supporting path is preserved for use in critical conditions such as used during path break conditions as a backup route.

3.The primary path is divided into segments: in this phase the routing algorithm has two different and nearer path for a single source and destination. These paths are segmented into smaller parts. The segmentation of these path helps in finding the compromised router and immediate the path break condition is discovered.

4. Each segment includes additional information to their next hop: during segmentation of routing path the additional routing information is added to the next hop of the router. That is basically a flag value which is set when the next hop of router is un-reachable. Thus the previous host gets or discover the braked segment of the network segment.

5. When a path break occurred, then determines which segment is failed during communication: in this process the segment is detected which is broken during communication using the flag value of the router.

6. Find the secondary path for that segment: as the router is detected where the path break occurred, the secondary path is utilized for appending with the primary path. This may help in recovering the current path which is damaged due to mobility. The above mentioned approach will likely to bring many of the significant outcomes as it tries to recover and repair the fault nodes in the path. There are below mentioned outcomes that we are trying to get from the approach, they are : Our work is targeting major issues in wireless sensor network that is fault node detection and recovery using, Partition Detection and Recovery Algorithm PADRA, the techniques are applied to find lost node information and repair the routes using proposed routing technique to discover the routing can give an optimum answer to that questions. This proposed routing technique involves a new technique to discover and recover the route path efficiently. There for a new routing technique with a technique is proposed in the above study to produce better outcomes recovery. Techniques are already investigated and a new feasible and efficient solution is developed. Our work is based on fault node recovery alogirthm which uses grade diffusion with genetic algorithm to find the faulty node and to replace them withactive node. The proposed routing technique involves a new technique master and slave to discover and recover the routine path efficiently. As this technique make use of primary, secondary path and data segementation only few sensor nodes have to be replaced in the whole network.

5.CONCLUSION

With this above work we tried to build efficient fault detection and recovery algorithm will not only identify a faulty node at the same time trying to find the alternative path in the network. Sensor networks are always suffering from issues like to target the life time and fault node discover and recovery. Techniques are already investigated and a new feasible and efficient solution is developed. Our work is based on fault node recovery alogirthm which uses grade diffusion with genetic algorithm to find the faulty node and to replace them withactive node. The proposed routing technique involves a new technique master and slave to discover and recover the routine path efficiently. As this technique make use of primary, secondary path and data segementation only few sensor nodes have to be replaced in the whole network.

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