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FAULT NODE RECOVERY FOR A WIRELESS SENSOR NETWORK

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Abstract: *In this paper we are proposing the fault node recovery algorithm which enhance the lifetime of wireless sensor network .When some of the sensor node are shutdown FNR algorithm is combination of grade diffusion and genetic algorithm .This algorithm result in fewer replacement of node and more reused routing path form our simulation active nodes in proposed system are increased by 8.7times than previous system also data loss rate has been reduced by 98.8% and the most important thin i.e. energy consumption rate has been reduced*
by approximately 31.1%

Keywords- *Genetic algorithm, Grade diffusion algorithm, Gradient diffusion algorithm, Wireless sensor network*

1. INTRODUCTION

In general each sensor node have limited or low level and battery power which cannot be replenished [3][4]. The wireless sensor network leaf will appear when the energy of a sensor node is executed, the failed nodes will not rely data to other nodes during transmission processing [3]. So, due to increase transmission processing sensor node will be burdened.

So, in our paper we are proposing a Fault Node Recovery (FNR) algorithm for enhancing lifetime of a Wireless Sensor Network (WSN). When some of the sensor nodes will be shut down due to battery energy or they or they may reached at their operational threshold [3]. Thus this algorithm makes replacement of sensor nodes and more reused routing.

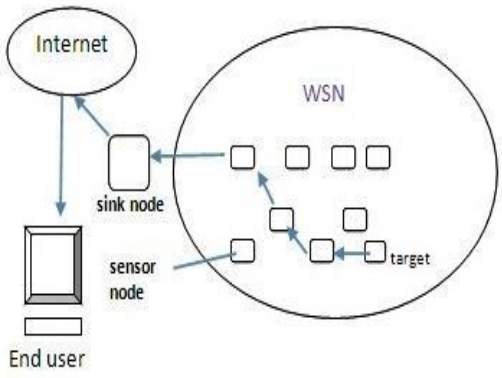

Fig.1: Wireless Sensor Network

2. LITERATURE SURVEY

2.1 Existing System

In WSN, each sensor node has limited wireless computational power to process and transfer the live data to the destination node. Therefore, to enhance the sensor area and the transmission area the wireless sensor network contains many sensor nodes [3]. Generally, each sensor node has a less power which cannot be replaced. When the energy of a sensor node is low [2], Data loss will appear, and the failed nodes will not relay data to the other nodes during transmission processing [5][3]. Thus, the load on other sensor nodes will get increased during transmission processing.

3. PROPOSED SYSTEM

This paper proposes a fault node recovery (FNR) algorithm to increase the lifetime of a WSN. When some of the sensor nodes get failed [4], either because they no longer have battery energy or they have reached their operational goal. Using the FNR algorithm can result in fewer replacements of sensor nodes and more reused routing paths [5]. Thus, the algorithm not only Increases the sensor network life time but also decreases the cost of replacing the sensor nodes [2]. The previous approach to sensor network routing includes the directed diffusion (DD) algorithm and the grade diffusion (GD) algorithm. This algorithm is actually based on the GD algorithm, with the purpose of replacement of less number of sensor nodes that are not functioning properly or it may have less battery power of reusing the maximum number of routing paths. The optimizations will ultimately increase the WSN lifetime and reduces sensor node replacement cost [5].

4. FNR ARCHITECTURE

In sensor networks, each sensor node has limited wireless computational power to process and transfer the live data to the base place. Therefore, to increase the sensor area and the transmission area the wireless sensor network typically contains numerous sensor nodes. In general, each sensor node has a low level of battery power that cannot be replace. When the energy of a sensor node is tired then wireless sensor network leak will appear and the failed nodes will not transmit data to the other nodes through diffusion processing.

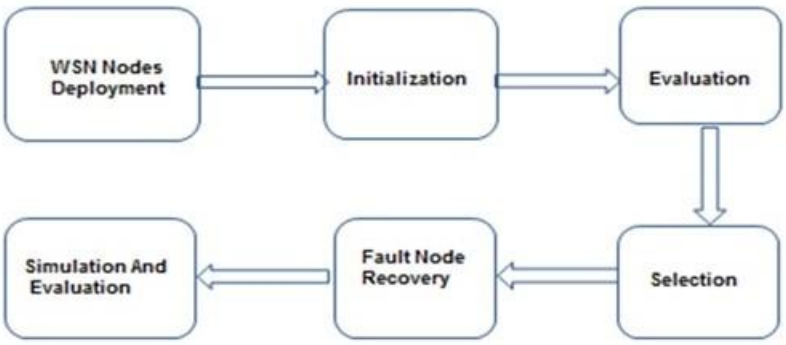

Fig.2: FNR architecture

4.1 FNR algorithm:

Step1:- Encoding of the problem in a binary string.

Step2:-Random generation of population or grade value.

Step3:-Calculate fitness of each solution.

Step4:-Select pair of parent strings based on fitness.

Step5:-Generate new string with crossover and mutation until a new population or grade value has been produced.

Repeat step 2 to 5 until satisfying solution is obtained.

5. ADVANTAGES

- The FNR algorithm requires replacement of fewer sensor nodes.
- In FNR algorithm we reuse the more routing paths.
- This algorithm increases the WSN lifetime and reducing the replacement cost.

6. DISADVANTAGES

- The malicious nodes may cause data seize, malfunction of sensor or depletion of battery.

7. CONCLUSION AND FUTURE SCOPE

In WSN sensor nodes have limited energy resources in addition to routing it is important to research the optimization of sensor node replacement cost and reusing the most routing paths when some of sensor nodes are non-functional [5]. Here we propose FNR algorithm which takes less time to send the packets to sink node [3]. Hence the energy and power consumption is less and number of non-functional nodes is less and functional nodes are more [2].

This paper proposes a fault node recovery (FNR) algorithm to enhance the lifetime of a WSN when some of the sensor nodes defuse, either because they have reached their operational threshold or they have no longer power[3][4] . Using the FNR algorithm can result in more reused routing paths and fewer replacements of nodes.

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