International Journal of Scientific Engineering and Applied Science (IJSEAS) - Volume-1, Issue-9, December 2015
ISSN: 2395-3470
www.ijseas.com

Recovery Scheme for the Failure Nodes in Wireless Sensor Network

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***Abstract*—Wireless sensor networks (WSNs) are an important for monitoring distributed remote environments. As one of the key technologies involved in WSNs, nodes fault detection is indispensable in most WSN applications. It is well known that the distributed fault detection scheme checks out the failed nodes by exchanging data and mutually testing among neighbor nodes in this network but the fault detection accuracy of a scheme would decrease rapidly when the number of neighbor nodes to be diagnosed is small and the node's failure ratio is high an improved scheme is proposed by defining new detection criteria. Simulation results demonstrate that the improved scheme performs well in the above situation and can increase the fault detection accuracy greatly. Wireless sensor-actor networks, sensors probe their surroundings and forward their data to actor nodes. Actors collaboratively respond to achieve predefined application mission. Since actors have to coordinate their operation, it is necessary to maintain a strongly connected network topology at all times. Moreover, the length of the inter-actor communication paths maybe constrained to meet latency requirement. Distributed Actor Recovery Algorithm (DARA) and PArtition Detection and Recovery Algorithm (PADRA)require every node to maintain a list of their two-hop neighbors and determine the scope of the recovery by checking whether the failed node. Cost-Aware SEcure Routing (CASER) protocol to address these two conflicting issues through two adjustable parameters: energy balance control (EBC) and probabilistic-based random walking. CASER has an excellent routing performance in terms of energy balance and routing path distribution for routing path security. We also proposed a non-uniform energy deployment scheme to maximize the sensor network lifetime. Our analysis and simulation will showing that we can increase the lifetime and the number of messages that can be delivered under then on-uniform energy deployment by more than four times. CASER has flexibility to support multiple routing. The main objective to have a network which gives assurance of packet delivery and give the node time to regain its so that it will be able to carry further load Packets on the network. This can be done by using shortest path. Prior work relies on maintaining multi-hop neighbor lists and predetermines some criteria for the node's involvement in the recovery. Multi-hop-based schemes often impose high node repositioning overhead and the repaired inter-actor topology using two-hop schemes may differ significantly from its prefailure status.**

***IndexTerms*-Fault Recovery;WSN;DARA;PADRA;CASER;EBC**

I. INTRODUCTION

Wireless Sensor Network are designed to monitor physical or environment states like temperature, sound, vibrations etc. The employments of sensors are important to forming a wireless network. The sensors serve as wireless data acquisition devices for the more powerful actor nodes that route the sensor readings and set forward an appropriate response. Failure of Nodes may origin the network to partition into restore blocks and would thus violate such a connectivity requirement. The employment of additional possessions to replace failed nodes impractical and moving of nodes becomes the best recovery decision [3].

When nodes fails, the neighbors nodes will individually confer with their possibly in routing table to decide on the appropriate way of actions and define their task in the recovery if any. Faulty nodes causes the network to partition into reinstate blocks, the neighbor nodes that belongs to the smallest block reacts. The target is to considerately sense, collect the information about the nodes failure and then send it to the observer for processing and analyzing. Sensors self deployment deals with independent coverage formation in sensor network and apply recovery scheme [9]. Actors are more capable nodes with relatively involved more energy supply and richer computation and communication resources. The transmission range of actors is significantly less. It is necessary for actors to rely mostly on existing radio links for coordinating themselves [11]. Distributed Actor Recovery Algorithm (DARA) and PArtition Detection and Recovery Algorithm (PADRA) require every node to maintain a list of their multi-hop neighbors and determine the scope of the recovery by checking whether the failed nodes. Cost-Aware SEcure Routing (CASER) protocol for WSNs to balance the energy consumption and increase network lifetime. CASER has the flexibility to support multiple routing strategies in message forwarding to extend the lifetime while increasing routing security. Both theoretical analysis and simulation will showing that CASER has an excellent routing performance in terms of energy balance and routing path distribution for routing path security. We also proposed a non-uniform energy deployment scheme to maximize the sensor network lifetime. Our analysis will showing that we can increase the lifetime and the number of messages that can be delivered under the non-uniform energy deployment by more than four times. CASER support secure delivery to prevent routing trackback attack and malicious traffic jamming attack in Wireless Sensor Network.

II. RELATED WORK

Ameer A.Abbasi[3] proposed a mechanism for a failure of an nodes may cause the network to division into blocks. One of the effective recovery methodologies is to autonomously reposition a split of the actor nodes to restore connectivity. Recovery schemes either require high node relocation overhead. To overcomes these shortcomings and presents a Least-Disruptive topology Repair (LeDiR) algorithm. LeDiR relies on view of a node about the network to invite a recovery

plan that relocates the least number of nodes and ensures that no path between any pair of nodes is extended.

Hong-chi shih[2] studied to enhance the life time of a wireless sensor network. When some of the sensor nodes shutdown. The grade diffusion algorithm and genetic algorithm result in less replacement of sensor nodes and more reused routing paths. The algorithm used number of active nodes and reduce the rate of data loss and reduce the rate of energy consumption.

G.Wang[8]Sensor exploitation is an important issue in designing sensor networks. This evaluates a spread sensor Protocols for mobile sensors. After discovering coverage holes the protocols calculate the position of sensors where they should move. The protocols that provide high coverage within a limited deployment time and limited movement. We use Voronoi diagrams to discover the coverage holes and design three movement-assisted sensor deployment protocols, VEC (VECtorbased), VOR and Minimax based on the principles of moving sensors from densely deployed areas to sparsely deployed areas.

S.Yang[9] study the proficiency of sensor networks depends on the coverage of the monitoring area. The good sensors deployments are necessary to balance the workload of sensors. The deployment of movement assisted sensor deals with moving sensor deals with moving sensors from an unbalanced state to a balanced state. The various optimization problems can be defined to minimize different parameters, including total moving distance, total number of moves, communication/ computation cost, and convergence rate. The SMART is developed to use scan and dimension exchange to achieve a balanced state and to address a unique problem called communication holes in sensor networks.

Y. Zou and K. Chakrabarty[10] cluster based distributed sensor deployment. A virtual force algorithm(VFA)as a sensor Deployment strategy to enhance the coverage after the placement of sensors, VFA attempts to maximize the sensor field coverage. Once the effective sensor positions are identified. The one time movement with energy consideration incorporated is carried out i.e., the sensor are redeployed to these positions. The positioning of sensors affects coverage, communication cost and resource management. The positioning of sensors affects given number of sensors within a cluster in cluster based DSNs. For a given number of sensors, the VFA algorithm attempts to maximize the sensor countryside coverage. We also propose a novel probabilistic target localization algorithm that is executed by the cluster head to query only a few sensors (out of those that report the presence of a target) for more detailed information.

X. Li[11] achieving focused coverage around a Point of Interest, and introduce an evaluation metric, coverage radius. The self deployment sensors is an important research that deals with self directed coverage formation in mobile sensor network. The two purely localized solution protocols Greedy Advance (GA) and Greedy-Rotation-Greedy(GRG), which are rigid to node failures and work regardless of network partition. The algorithms drive sensors to move along a locally-computed triangle tessellation(TT) to surround the Point of Interest. In Greedy Advance, nodes greedily keep as close to the Point of Interest as they can; in GRG, when their greedy advance is blocked, nodes rotate around the POI to a TT vertex.

III. MOTIVATION

The aim is to detect the failure nodes and recover the failure nodes. To achieve a high message delivery ration. Our routing protocol should try to avoid message dropping by multiple node path when an alternating routing path exists, recover and to balance the energy consumption and increase network lifetime. Our analysis showing that we can increase the lifetime of wireless sensor network

IV. PROBLEM STATEMENT

Considering such a problem with collocated nodes failure are more complex and challenging in nature to investigate this issue. Nodes failure occurs due to depletion of battery, network congestion etc. packets are loss due to nodes failure and transmission process gets blocks.

Also includes factoring in coverage and ongoing application tasks in the recovery process and developing a test bed for evaluating the various failure recovery schemes. Due to applying the recovery scheme, the transmission processes are continuing and data should reach to the destination successfully.

V. PROPOSE WORK

Recovery of network failure is very time consuming and complicated. We have to generate combinational methodology to improve and enhance in the existing technique. To propose the algorithm which provide the fast recovery and give the assurance of data packet delivery. The propose protocol detect multiple faulty nodes and apply the recovery scheme. The faulty nodes are also repair so that it used for further work

In fig.1 Let us assume that number of failure occurs during the transmission process. The Nodes B and D are fails during the transmission of data from source Node A to destination Node F then apply the recovery scheme send the data from the another Path that is to be the shortest path.

In Fig. 2 shows the faulty Nodes are in recovery state another packet transmission are going from Node A to M through Nodes B and D. DARA maintaining the list of the Multi hop and restore the network connectivity and generate the routing table send the data using shortest path. CASER has an excellent routing performance in terms of energy balancing and routing path efficiency .CASER provide multiple routing path and find out the energy of each nodes, if the bettery of nodes depleted due to overload then CASER find out those nodes i.e the faulty nodes an giving the message to PADRA, it indicating the faulty nodes and apply the reovery scheme send the data from the another pathe using SRT. After regain of the faulty nodes CASER analyze the nodes in recovery state forwading the data through that nodes.

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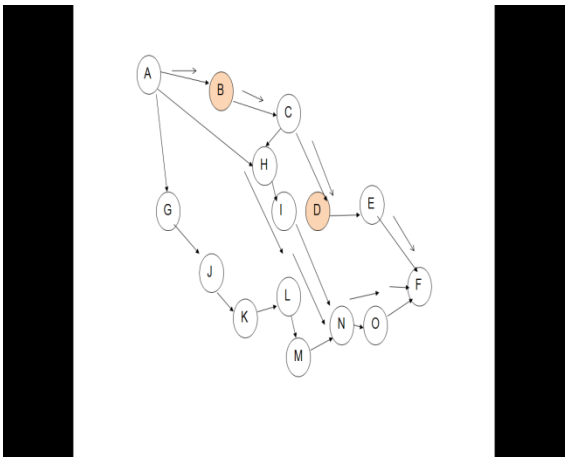

Figure 1. faulty Nodes and Apply Recovery Scheme

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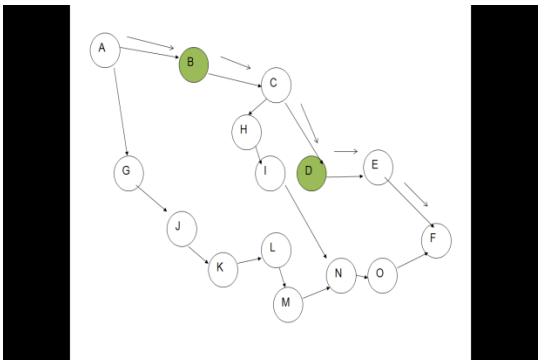

Figure 2. Faulty nodes in recovery state

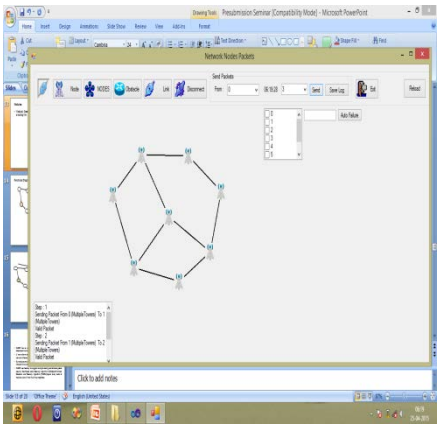

Fig. 3. Showing Network and send the data in Shortest Path

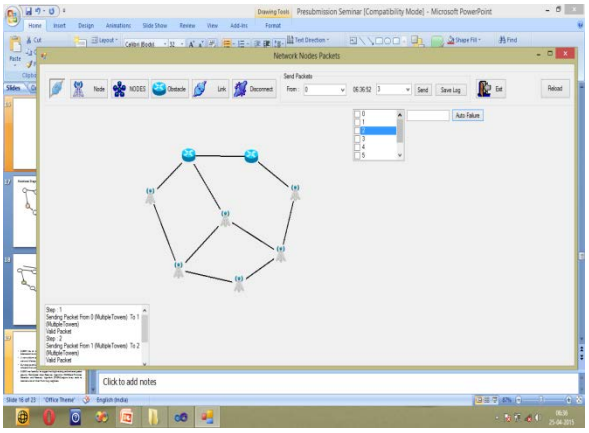

Fig. 4. Fault nodes detection

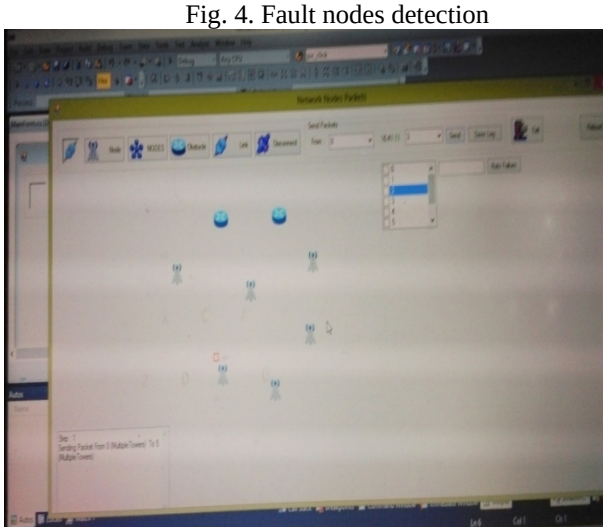

Fig.5. Apply the Recovery Scheme

The result shows the network creation and sends the data using SRT and detecting the faulty nodes.

VI. CONCLUSION

In this project, To propose a secure and efficient Cost-Aware SEcure Routing (CASER) protocol for WSNs to balance the energy consumption and increase network lifetime. Our analysis and simulation will showing that we can increase the lifetime of wireless sensor network and Distributed Actor Recovery Algorithm (DARA)and PArtition Detection and Recovery Algorithm (PADRA)require to maintain a list of their multi-hop neighbors and determine the scope of the recovery by checking whether the failed nodes. It also provide the assurances to packet delivery. CASER has flexibility to support multiple routing. The main objective to have a network which gives assurance of packet delivery and give the node time to regain its so that it will be able to carry further load Packets on the network. This can be done by using shortest path. Prior work relies on maintaining Two-hop neighbor lists and predetermines some criteria for the node's involvement in the recovery. Multi-hop-based schemes often impose high node repositioning overhead and the repaired inter-actor topology using two-hop schemes may differ significantly from its prefailure status

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