Self Adaptive Routing with Smart Bandwidth Utilization for WSANs: A Review

Gurpreet Singh　　　　　　　　　　　　　**Dr. Bikrampal Kaur**
M.Tech, Computer Science Engineering　　　　Professor, Computer Science Engineering
Chandigarh Engineering College, Landran　　　Chandigarh Engineering College, Landran
Mohali(Punjab), India　　　　　　　　　　　Mohali(Punjab), India

Abstract: Provisioning network survivability is crucial in wireless sensor and actor network (WSAN) because nodes deployed in hostile environments are vulnerable to common failures. Failure of an actor appreciably effect actor linked coverage that's vital for powerful network operation. Existing mobility-based recovery schemes are both geared towards restoring inter-actor connectivity or network coverage. None of them consider sustaining actor coverage (i.e., having sensors reachable to actors) while restoring inter-actor connectivity. This paper presents balanced topology to manage lifetime and load over WSAN.The simulation is aimed at evaluating the performance of the wireless sensor networks (WSNs) and wireless sensor and actor networks (WSAN) in the proposed simulation.The WSN and WSAN are being implemented in a balanced topology along with an adequate number of sensor nodes. The sensor nodes will be evaluated under various scenarios.

Keywords: WSN, WSAN, Bandwidth, Node, Actors

I.　INTRODUCTION

Over the past few decades, computers have exponentially expanded in processing energy and on the equal time reduced in both price and size. WSNs are beginning to become a truth, and therefore a number of the long omitted barriers have end up a critical area of research.

According to recent research on WSN, the researchers try to find out and conquer barriers of the wireless sensor networks inclusive of: limited energy resources, varying processing consumption based totally on location, high value of transmission, and restrained processing abilities. Routing processes which have labored so nicely in traditional networks for over two decades will not suffice for this new generation of networks.
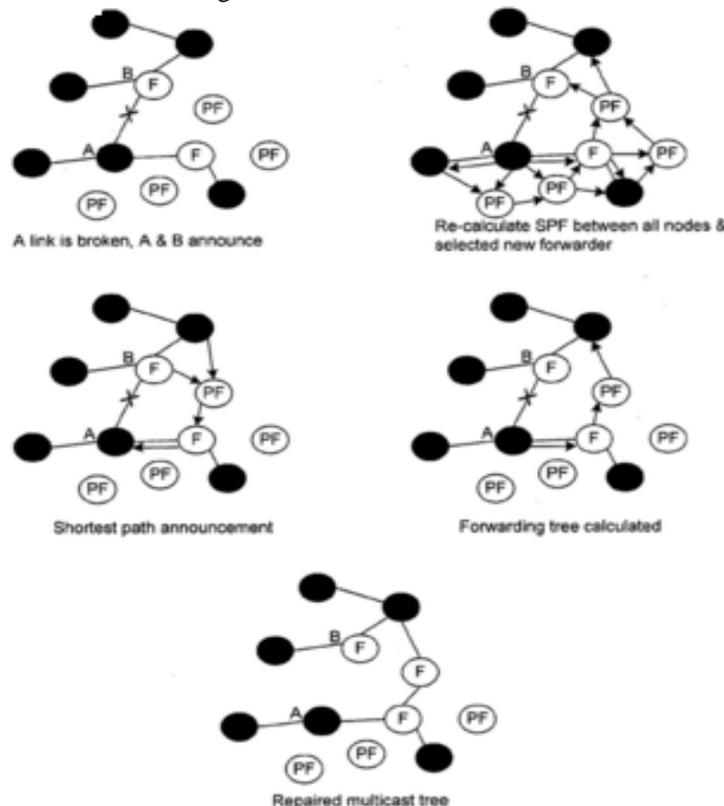

Figure 1: The routing scenarios for shortest routing and failover management

In-spite of maximizing the lifetime of the sensor nodes, this is more preferable to distribute the energy consumption throughout the WSN in order to minimize maintenance and maximize overall network performance. Any network communication protocol which involves synchronization between neighbor nodes has some overhead of setting-up the communication. WSN routing or clustering protocols determine whether the benefits of extra complicated routing algorithms overshadow the extra control messages each node needs to speak. Each sensor node could make appropriate decision regarding its communication options if they had complete knowledge of the entire network and level of power of all the sensor nodes. However, when you consider that all the nodes might always need to have global knowledge, the cost of the synchronization messages could in the end be very highly-expensive. For both the diffusion and clustering algorithms, we can analyze both realistic and optimum schemes in order to gain greater perception inside the properties of both strategies.
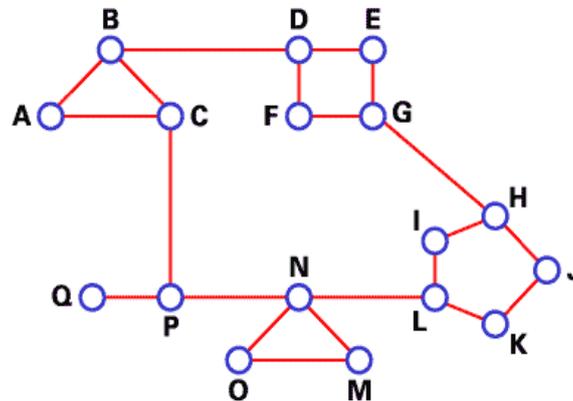

Figure 2: The self organized routing scenario with the nodes connected with every possible path

WSNs usual topologies include many sensor nodes deployed throughout a specific area. There's generally no unique structure or hierarchy in place and therefore, the WSNs are considered to be ad hoc networks. Base stations are typically more complicated than mere sensor nodes and typically have an unlimited energy power. It is ideal to transmit data in several smaller hops rather than one complete data package transmission over a long distance of communication.

II. SELF ORGANIZED ROUTING

Overlay topologies are typically utilized in unstructured peer-to-peer networks so as to boost the overall performance. numerous analysis works coping with communication challenges and issues associated with the dynamic networks gave abundant interest to overlay topologies to induce a far better network organization. Recently, some overlays giving scale-free and/or small-world properties are projected. However, most of the works especially for the structural aspects and don't provide abundant importance to the routing data and the associative information carried by peers.
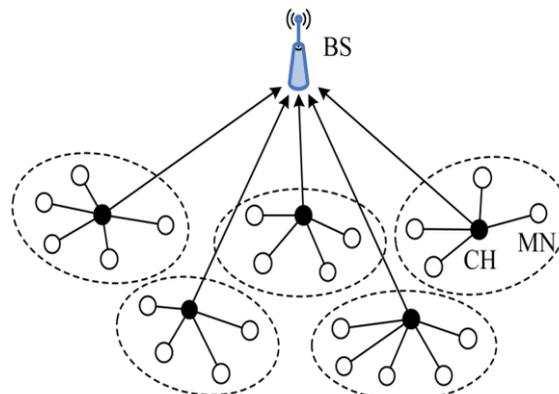

Figure 3: The peer-to-peer routing scenario

III. PREVIOUS STUDY

Geon et al. [1] WSN consists of number of sensor nodes to gathering various information including sound, temperature, location, etc. Application of WSN is also vast like monitoring system, healthcare, military, and many more. It is very difficult to replace or recharge the deployed nodes which have limited battery capacity. It is based on minimizing the Euclidean distance between cluster head and member sensor nodes. A Simulation result shows that the proposed system allows higher performance than the existing hierarchical routing protocols in terms of network lifetime like HEED or LEACH.

Palden et al. [2] authors proposed a hierarchical and cluster based energy efficient routing protocol. The selection of selects the Cluster Heads (CH) procedure is carried out by using the two stages. First stage includes the list of all suitable candidate nodes for becoming CH are listed, to ensure the best CH selection some internal parameters are considered by the BS like relative distance of the candidate node from the Base Station, probable number of neighboring sensor nodes

the candidate node can have, residual energy of nodes and the past track of candidate node including list of selected CH for the same candidate node. Proposed model is compared with the existing modesl like LEACH, to ensure the performance of proposed model and It is observed that the proposed protocol outperforms LEACH. SajalSarkar et al. [3] proposed an energy consumption model to calculate the energy-factor1 of the nodes and then propose a trust based protocol for energy-efficient routing. They have also adopt a trust module to track the value of routing metric. Experiments would be conducted to compare the proposed protocol on the basis routing overhead, and increases packet delivery ratio by consuming less energy with AODV and DSR, the popular existing routing protocols.

BEN et al. [4] In this paper Authors have propose a protocol named Hierarchical Adaptive Balanced energy efficient Routing Protocol (HABRP) to decrease probability of failure nodes and to prolong the lifetime before the failure of the first node in heterogeneous WSNs, that is important for many applications. In heterogeneous networks, there are some higher energy sensors nodes are available called NCG nodes (Normal node/Cluster Head/ Gateway). They are elected as CH to collect and aggregate the data of their specific cluster members and transmit it to the parent gateways that requires the minimum communication energy

XU Jiu-qiang et al. [5] has proposed the algorithm that can be used to identify the connected key sensor nodes in WSN. They proposed an algorithm to enhance the connectivity between nodes in WSN by using additional mobile nodes. Based on the mentioned algorithm a path planning algorithm for sensor is also proposed in order to improve the lifetime of the WSN and decrease the influence of connected key sensor nodes on the WSN lifetime. This could be achieved by discovering the connected key sensor nodes and the removing the negative impact cased via the connected sensor key nodes that could enhance the topology of WSN and prolong the lifetime of WSN.

IV. METHODOLOGY

Before everything, the literature at the WSN clustering protocols and WSN procedures would be studied in detail. After getting the results of proposed system, is compared with the existing system so that the accuracy of the proposed system could be analyzed. Getting the parameters information used in WSN clustering algorithm is also very important.
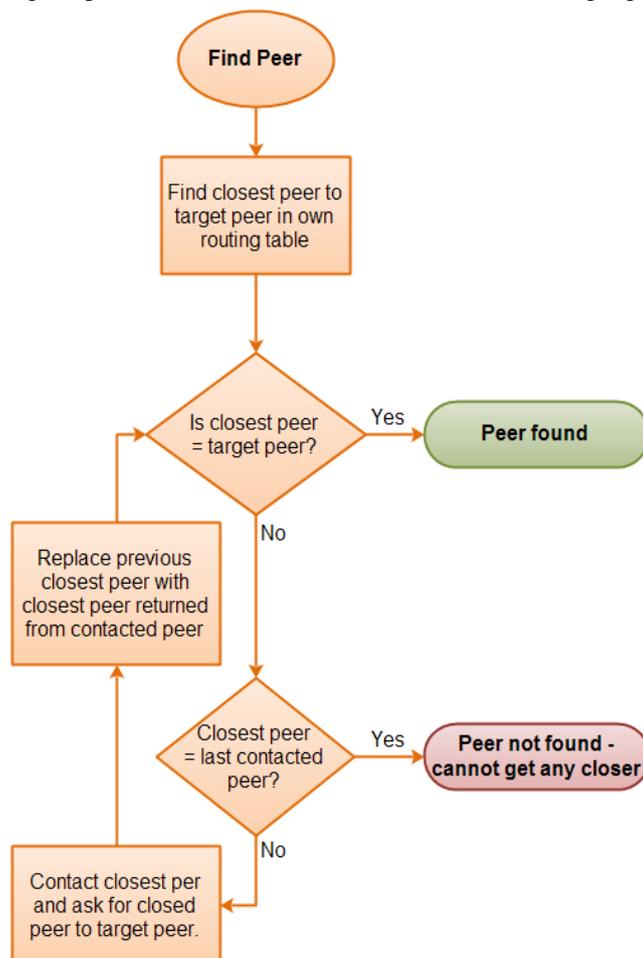

Figure 4: The peer-to-peer routing workflow

V. CONCLUSION

Advances in technology have decreased the size of WSN, allowing it to function in restricted and smaller area. It limits the power consumption and computational capacity of WSN. Incorporating an energy efficient algorithm in the design will definitely reduce energy consumption and reduce cost of maintenance due to unwanted shorter network lifetimes. Proposed model enable the wireless sensors network to implement the algorithm to efficiently broadcast the collected information to ensure the energy efficient of the network and send the ciphered information to the BS.

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