A Survey on Deployment strategies and Energy Efficiency of WSN for Security Enhancement

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ABSTRACT

Emerging advances in communications technology, it is the wireless sensor network (WSN), consisting of a large number of sensor nodes, widely such vehicle tracking, agriculture, military, forest monitoring, medical care, environment, such as an earthquake observation, such as, a variety of application areas in is used, the sensor node, a smaller computing power, less memory, and minor range of less battery power and communications strength are provided. These sensor nodes, in order to monitor the environmental system based on the WSN applications, are deployed in a particular position. Energy use in these wireless sensor network is a very important issue to increase the lifetime of the sensor network. Researchers in the wireless sensor network is taking into account the energy use as an important task, we are considering a number of new protocol. According to existing literature, by taking at least twice the communication range coverage a detection range, which means the connection. This leads to an increase in energy consumption in WSN. In this paper, we focus on the optimization model of the WSN along with security considerations. This maximizes the WSN coverage,security, works to minimize the energy consumption of the node.

Keyword : - *WSN ,Deployment ,Energy Efficiency, Security and Routing etc….*

I. Introduction

Wireless sensor network (WSN) is, communicate with each other low power consumption via a wireless link, is composed of a set of low-cost, and autonomous sensor nodes. Each sensor node is to transmit data on a radio channel, it is accelerated by the plurality of power levels. Each sensor node is mainly run by the battery power supply. Constraints imposed on the WSN is due to the low supply of energy. Sensor nodes, usually, has been deployed at a high density. Each sensor node has a such detection function can detect the data of the limited area, called a radius detection. Each node, and do some of the local processing, the case can be sent to the sink node by using some of the routing technology, it is responsible for collecting the data from the environment. Sink node receives the data from the node of the circumference, which, via the Internet, or sent to the outside either via a number of satellites. Therefore, as long as collects data from the same environment to the sink, related to transmission, it is necessary to connect a range of both W SN is maintained at the desired region [1]. Coverage is interpreted normally, and there is also a method of monitoring the environment in which the nodes in the WSN has been specified. The specified environment is the form of the area of the entire deployment, it may be some of the possibilities of a deployment area or a specific point of the entire specific area, the violation. Based on these above criteria, it is classified the coverage into three types.

1) Area coverage
2) Target coverage
3) Barrier coverage

• Area coverage: It refers to the observation of the whole area. This is because every single point in the certain fields in [2] interest, must come under the detection range of the at least one active sensor nodes, it means that. Ideally, the number of sensor nodes that number has been placed in the active sensor node is the minimum, even if very high.

• Target coverage: this case, the target is represented as a set of discrete points within a particular field of interest, the target or the point should be covered by the sensor nodes of the at least one active [3], [4]. This type of coverage is, basically, has been used in military applications.

• Barrier Coverage: refers it or observe the movement of the moving body entering the boundaries of the given field of interest, the movement across the sensor field, [5], [6]. Intrusion detection is an important application barrier coverage.

Along with the coverage, is an important consideration in the WSN to maintain the connectivity [7], [8]. Connection is defined as the ability of any sensor node for transmitting the information collected in the sink. Sensor nodes, that

is, when route for transmitting data unconnected sink is not available, does not help the collected data. Communication range of node, other nodes are defined as an area that can be arranged to receive the data. This node is different from the detection range, which is defined as the area in which it is possible to observe the event.

That increases the network lifetime, in order to satisfy the important requirements of WSN, all nodes in the network, when it is necessary to use a low power level for communication simultaneously, the connection between the coverage throughout the network There is a need to maintain.

Coated with WSN, in order to achieve both connection and also plays an important role placement of the sensors.Sensor deployment, can be divided into two basic types, ie dense deployment and sparse deployment.

• it is necessary that the high-density arrangement to detect all of the events or a plurality of sensors, it is, in a situation where there is a need to cover the desired area, usually is useful.

• Sparse deployment is basically using the minimum number of sensor nodes, it will help to achieve maximum coverage.

Some of the researchers have already communication range, we deal with the coverage and assume that is the detection range of at least twice the connectivity issues.

II. Literature Survey

A Howard [6] potential field, all of the sensor nodes, presents approaches to the deployment method, which has been planned in the order, such that they are repelled by intermediate hurdle with its adjacent node. This brings the spread of the sensor nodes throughout the chosen environment. This process can be applied to both distributed and scalable nodes. With this repulsive force, viscous friction is applied to the sensor node.

Hou [18] discussed the role of the relay node (RN) to the deployment of a static mode. They are a group of sensors implements the architecture of the two-layer sensor network that is organized; each group, aggregation and forwarding (AFN) node has led.

Process of deployment of the sensor nodes in WSN are processed in three major schemes. they are,

I. Deployment of static node

II. Deployment of dynamic node

III. Awareness node place the energy

Performance is reduced, in the case of the static node expansion , the sensor node is fixed to a specific region. However, in the case of dynamic node deployment, sensor nodes, a mobile, and therefore, performance will increase. The energy-aware node expansion, each sensor node, the energy is provided, the collected, will be used to transfer data. It also describes the speed of the energy consumed by the node for the transmission of data.

A. Primary Development object of the nodes suggests, the sensors to expand acquired as to match the mainly overall design goals. Therefore, most of the deployment strategy of nodes that are proposed in the literature, to optimize energy consumption to maximize the coverage area, to achieve a strong network connection, to extend the life of the network, and / or data we have focused on increasing the fidelity.

B. Deployment of static node

Deployment of static node is the best place to take into account the position of the nodes that are not changed to optimize energy and WSN of life. Here, after the placement of the sensor, further there is no movement in the network [16]. It does not have the ability to static sensor to get Change at that location [13].

1) static node deployment based on a strategy of deployment

In WSN, sensor nodes, generally, have been deployed in random or deterministic (control) to one of the selected area. Not only the deployment of nodes in the coverage of the area, not only the impact will affect the characteristics of the network topology. There is a control type of deployment of the node sensors, and if it is more expensive, the procedure of the sensor, ideally, needed when they are under the influence of the expansion area. This deployment method, depending on the distribution and level of redundancy of the sensor node, we have achieved perfonnance goal necessary. As one of the parameters for performance measurement, by considering the fault tolerance, the R-random arrangement has a good placement strategy is concluded [3]. Because they transmit a lot of traffic, as there is a tendency to be fairly quickly exhaust its energy (battery), the main reason is the expansion of the plurality of nodes close to the base station. Therefore, to the base station to protect the spare parts availability for exchanging the relay node (RN) which sensors population fails to maximize Therefore, the network connection [3].

2) static node deployment based on the purpose of the optimization,.

In WSN, the sensor must be deployed in a way you want a complete design goals. Therefore, most of the methods developed in the literature, won a strong network connection to maximize the coverage, the life of the network increases, and are concentrated / or to achieve the fidelity of data. The second objective ie, the allowable range of node failures and load balancing is also considered [3]. Attempt, the minimum amount of resources, for example, is done to maximize the design goals by utilizing the number of sensor nodes. Achieve the design goal

Distribution of random sensor node is the highest challenge. On the other hand detenninistic deployment is, in theory, to achieve the goal of all primary and secondary. However, network resources necessary keep a very difficult problem [3].

C. static node deployment algorithms

Algorithm for the deployment of static node, is an artificial bee colony algorithm (ABC) algorithm and optimization algorithm based on the bio-geography (BBO). These algorithms can be applied to the development of the dynamic node.

D. dynamic node deployment algorithms

Depending on the area covered by the TUM to find the position of the sensor node, it is an important concept of deployment. The type of dynamic node deployment, sensor nodes are located in the first randomly selected areas. Deployment decision will be taken at the beginning of the network set up, it does not depend on the dynamic changes between the network functions.

Tian [10] has been proposed to ensure coverage algorithm complete coverage area by using the sponsor area technology. If the node receives a packet from the active neighbors, according to this algorithm, the node determines whether or not considered or redundant node sponsored area. Sponsorship area is defined as the maximum sector which is covered with a neighbor. Detection area of the node, if you are covered under the auspices area of the whole of the neighbor, the node, to determine the status of as a redundant, becomes inactive. In this way, all of the nodes that are not redundant is remains active. In this paper, we will focus on only the scope without considering the connectivity between the active node.

Ye [11], [12] have proposed a probing environment and adaptation (PEAS) protocol to achieve the sensing coverage to WSN. In this protocol, the node is three states, namely sleep, will be present in any of the probing, and work. Top, each node is located in the sleep state. After a certain period of time, each node is started, will be probing state. In probing state, the node sends a probe message for any of the work node examine whether there within its probing range. If the answer does not come from neighboring countries as a working node, to change their own state in the node is operating state, otherwise, it will return to the back-dormant state. Protocol is very simple, as can be increased or decreased to the number of nodes of the work satisfies the full coverage, gives provision for changing the range of the probe.

Guputa [13] have proposed a distributed algorithm as well as concentration for coverage in WSN. This protocol, to meet the connectivity between the active node. Centralized algorithm, "n" is the number of nodes with the same sensing radius will build O (log n) the optimal size of the factors, the optimal connection cover of the inner. However, distributed algorithm, it does not meet the coefficients of the same O (log n). Sensor nodes, in view of the fact that the energy constraint, the authors, each node is assigned a specific weight, has proposed a weighted version of the same protocol. Protocol, you can select a subset of the connection of the node with the minimum total weight of. To extend the life of the network, nodes, when connected subset selection, to obtain the node is selected with higher residual energy, less rest than can be assigned a higher weight we have the energy.

Node communication radius and Zhang as long as at least two times the sensing radius of the Hou, taking into account the coverage along with the [9] connection of the problem, Author proposed a theorem, that is, of the convex region, complete coverage, active. This means the connection between the set of nodes.

In addition, the communication radius of the node has designed the only applied geometric density control algorithm of distributed named OGDC on the condition that equal to two times of greater than or sensing radius. OGDC runs very close to the optimal solution of a dense network. Therefore, we are in the early stages of our proposed algorithm, in order to make the sensor node to active, uses this algorithm. Cited above, After analyzing the related work, in order to maintain the connectivity between the active node, they will find that you are dependent on the important condition that has been proposed by Zhang [9].

III. Conclusion

The explosive growth of WSN's applications resulted in the pass through the various issues. One of the important challenges is to maintain both coverage and connectivity in WSN. The problems which comes in to focus during survey of various techniques include the deployment strategy adopted to get point of contact, the type of point of contact, the network energy consumption levels along with the types of nodes available in respect to their energy provided before deployment, Over utilization and under utilization of some of the nodes present in the network. This paper survey and analysis provides the detailed effects of deployment strategies. Deployment strategies not only effects the coverage but the energy consumption levels in the node as well. Deployment seems to be an integral part of the overall process for a energy effiecient wireless sensor networks. On other hand, the energy efficiency is of the network takes care of the every mechanism included in the communication process. The factors affecting the energy efficiency include the deployment, communication model, states available to wireless sensor nodes and their mode

of operations. Based on the deployed research a new scheme for the security can be researched to enhance security to higher levels.

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