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VGDRA (Virtula Grid Based Dynamic Routing Protocol)

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Abstract
Routing is defined as the process of finding the route for data transmission in the network. In wireless sensor network various sensor nodes are present that are used for the sensing, computing and communication. An external mobile sink is present that is used for the communication with the nodes directly. Previously the static sink approach was used but had some limitations so later this was replaced by the mobile sink approach but still the problem of the minimizing the energy consumption and increasing the life time of the network exist. So in this paper the VGDRA routing algorithm is proposed that uses the mobile sink approach. This method reduces the route reconstruction cost by allowing the limited nodes to readjust their location in accordance with the sink. Various experiments were performed and from the results obtained it is conclude that the proposed method of routing is an efficient approach for the route selection.

Keywords
Routing ; Wireless Sensor Netwotrk, VGDRA, Network Life Time, Mobile Sink

I. Introduction

In wireless sensor network the nodes are used for the communication. Due to presence of large numbers of nodes in the network a route is set for sending the data from the source to the destination node. This process of data transmission between the nodes is termed as the routing. The efficiency of the network also depends on the selection of the path the as it effects network life time, energy consumption etc. Various routing algorithms have been designed for the efficient routing process. The wireless sensor networks are reliable, accurate, cost effective and easily deployed. The life time of the network is defined by the energy consumed by the sensor nodes. So various routing mechanism have been developed that will help in increasing the life time of the network by consuming less amount of energy. The network efficiency depends on the energy consumed for transmitting the data by the nodes.

Various routing algorithms have been designed for the efficient routing process. Earlier the static approach of the routing was replaced by the mobile sink approach in which the sink is kept mobile .In case of static sink the nodes that were near to sink received more energy than the nodes that are far way, this leads to the decrease in eth life time of the network .With the help of the mobile sink the balanced amount of energy is transferred among the nodes. While the routing is performed every time a new route is constructed in order to get the best route. This will leads to increase in the route construction cost and also the energy consumption is more.

The energy of the network is to be conserved so a virtual grid based dynamic routing protocol is proposed that will minimize the route reconstruction cost of the sensor node. With the help of the VGDRA only the few nodes will readjust there route in accordance with the sink. This will decrease the route reconstruction cost and also the energy consumption is reduced.

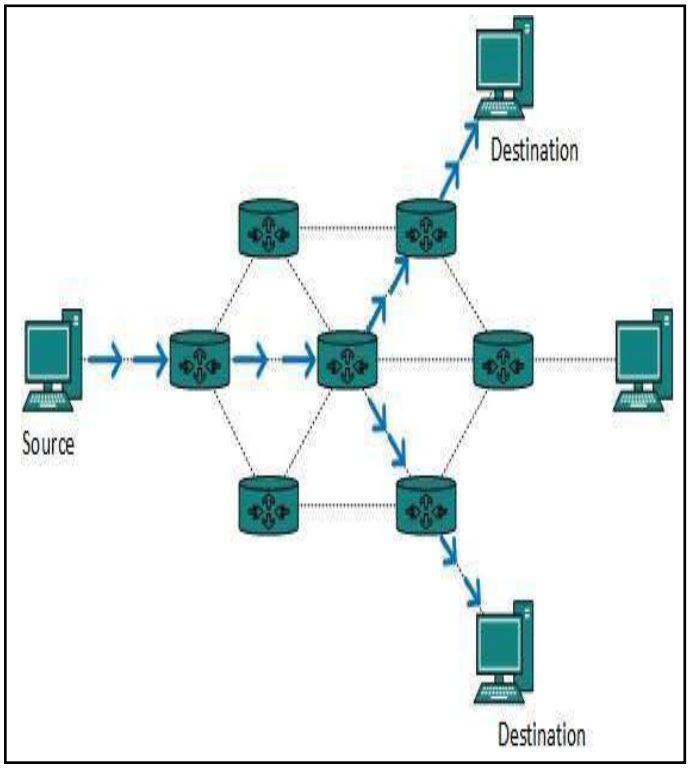

Fig. 1 : Routing in the network

II. Virtual Grid Based Dynamic Routes

Routing is the basis process of the data transfer between the source and destination .Previously the routing is done on the basis of the minimum distance from the sink. In wireless sensor network for the collection of the periodic data VGDRA have been proposed. The virtual grid based Dynamic routes adjustment is basically design for the optimizing the tradeoff between the energy utilization and the data delivery performance.

In this scheme the VGRDA outing protocol is studied. It is basically design to minimize the reconstruction cost of the route. In this method the virtual structure is created in which the nodes are deployed in the sensor field. Each node that is present in the sensor filed will track the location of the sink.. these sensor filed will be divided into equal number of cells due which a grid structure is formed. The main of this virtual structure is to reduce the reduce the energy consumption while the routes are reconstructed and

readjusted. This routing is efficient as the life time of the network is increased.

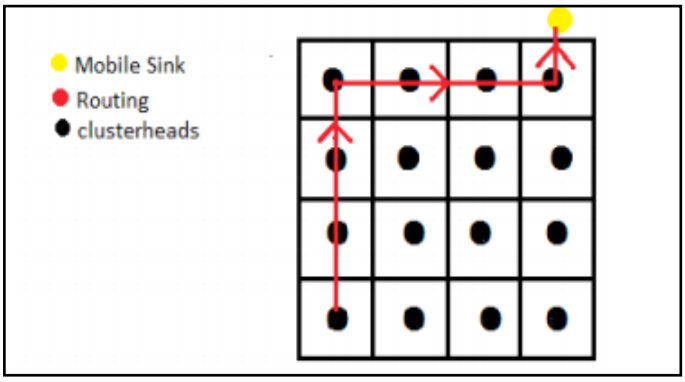

Fig. 2 : Virtual gridding based dynamic routing

III. Literature Survey

Routing is defined as the process of finding the route for the transmission of the data. For this various routing protocols are designed to the find the best route in which the energy consumption us less and the life time of the network is more. Traditionally static sink based approaches were used, then the mobile sink approach were proposed, recently the Virtual Grid-based dynamic routing is introduced that is consider to be more efficient than the traditional approaches. This section defines the work that is done in this field, various papers were studied some of which are described below:

Kinalis, S. et al [1] presents the new approach that will reduce the energy consumption of the network. This is basically an adaptive sink mobility scheme. The mobility of the sink is manipulated and is controlled according to the network dynamics. This protocol is basically designed to improve the energy –latency trade-offs.

W. Khan et al [2] presents the Presents the data collection scheme based on eth mobility of the sink .In this existing scheme is divided into three classes that are termed as the constrained, path unconstrained, and controlled sink mobility-based schemes. The mobility of the sink node is related to the lifetime of the network. Various routing techniques have been proposed that will affect the performance of the network. These protocols have result in increasing the data delivery latency and reducing packet delivery ratio. From the results it is concluded that the still some issues needs to resolved of the mobile sink .

Abdul Waheed Khan et al [3] present a new routing method that is named as VGDRA. The main of this method is to reduce the reconstruction cost of the route simply by readjusting some of nodes with respect to the sink. From the results obtained it is concluded that the proposed routing method is better than the traditional methods..In this method set of rules are defined for the communication.

Er. Shilpa jaswal et al [4] present the communication rules that are used for governing the routes reconstruction process. This is simply done by readjusting the limited number of nodes to readjust their routes toward the mobile sink. VGDRA is designed for the minimizing the route reconstruction cost of the sensor node there by increasing the performance of the network. From the results obtained it is concluded that reconstruction cost of the route is reduced and the life time of eth network is also increased. in this some of the recent techniques have been used for improving the life time of the network

Adnan Fida et al [5] this paper presents the approach for the route selection for the transfer of the information from the source node to the destination node. In this position –aware protocol is used for the data transmission is proposed for sensing the data. From the results obtained it is concluded that this method is better than the traditional approach.

Aysegul Tuysuz Erman et al [6] presents a comparison and evaluation of the various data dissemination protocol on the basis of the latency and the data delivery ratio. From the results obtained it is concluded that the overall energy consumption of the network is reduced and the packet delivery ratio is increased.

Preetinder Kaur et al [7] present the implementation of the VGDRA algorithm. This is basically a route adjustment technique for the mobile sink that is used efficient data delivery. The basic aim of this method is to reduce the route reconstruction cost of the sensor node. From the results obtained it is concluded that this approach is efficient as the energy consumption is reduced and along with that the life time of the network is increased. In addition to thus the comparison is also performed that will show this VGDRA method is efficient.

IV. Virtural infrastructurebased protocol

Data dissemination is the premeditated method of data distribution among the nodes of the network. Various virtual infrastructure based data dissemination protocols have been designed so far mobile sink based wireless network. Some of the protocols have been discussed below

1) Virtual Circle Combined Straight Routing : In this a virtual structure is designed having virtural circles and the staright lines. The sink will circulate in the sensor field and will colect the information . In this the set of rules are defined for minimizing the readjustment cost of the route that is based on the current loation of the sink . though this protocol is effcient as the route reconstruction cost is minimise but due to the presence of the cluster head at the center of the sensor field can cause descrease in its energy .

2) Hexagonal cell-based Data Dissemination: In this algorithm a hexagonal grid structure is formed for the data transmission considering multiple numbers of mobile sinks. For avoiding the sink data quires the data is evenly distributed into the six different directions of the hexagon formed .The node firstly distributed data to the center line. The nodes that are at the end will store and replicate the data..Due to the presence of the mobile sink after the sink change its position from one cell to another it informs both center node and the nodes present along the border. In this way the more energy is consumed if the speed of the mobile sink is more.

3) Backbone-based Virtual Infrastructure: This is the data dissemination in which the single level multi-hop clustering is used .the main of this objective is to decrease the number of clusters. So that every cluster heads should know about the location of sink according to which it will set its route. As this method is consider to be one of the best methods but the life time of network decreases.

V. Conculsion and Future Scope

In wireless sensor network the process of finding the route for the transmission of the data from the source to the destination is termed as the routing. Various routing protocols have been designed for finding the route in the network. The protocol that is designed for the routing should consume less energy and distance. In this paper

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the Virtual gridding routing protocol is proposed that is used for reducing the route reconstruction cost. From the literature it is concluded that this proposed method is better than the traditional routing protocol. . As the energy consumption is decreased and also the lifetime of the network is increased. So this method is considered to be efficient.

From the literature it is concluded that VGDRA method is efficient and better than the traditional routing algorithm. In future this technique can be further enhanced. The selection of the route should be done in the more efficient way so that the energy consumption of the network is reduced and the life time of the network is improved.

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