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Research paper



Analysis of clustering in wireless sensor networks

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Abstract

Location based routing using Global Position System used for establishing the nodes in wireless sensor networks making uses of clustering along with the location based routing is used for faster reliable and reduced Hops with minimum energy consumption and by using of minimum spanning tree algorithm to achieve a shortest path in a network. Clustering in wireless sensor network is used for improving network lifetime. We propose effective method called enhanced route optimization in clustering is performed using minimum spanning tree algorithm.

Keywords: *Clustering; Energy Efficient; Routing; Throughput; Wireless Sensor Networks*.

1. Introduction

The processed information is thought a wireless communication .In wireless communication the information is sensed by the sensor a called wireless sensor and the networks and protocols are used with those sensor to communicate with the a devices are called the wireless sensor networks wireless sensor networks consists of spatially distributed autonomous sensors to monitor physical or environmental conditions such temperature, sound ,pressure and co-operatively pass their data thought the networks to a location. Wireless sensor networks have a many applications; wireless sensor networks are used to monitor a behavior of the networks. One of the major drawbacks in wireless sensor network is energy consumption. The re-chargeable batteries are not suitable for complete operation. From Advice by the experts we can overcome the drawbacks in wireless sensor networks by using clustering algorithm .we can also increases the network lifetime and so on. In our effectively deal with energy consumption in network.

2. Types of routing protocols

The responsibilities of a routing protocol is exchanging of information and finding feasible path to a destination. A good routing protocol should be able to solve all problems in a network. Routing protocols for wireless sensor network are classified into four types. They are based on routing information update mechanism, based on temporal information for routing, based on topology, based on utilization of specific resources. In our protocol is the Location based routing protocol and it comes under specific resources protocol and it make the nodes aware of their position. In location based routing protocol first it find the location of the node and its neighbours position.

3. Related works

The clustering algorithm comes to makes an important contributes in wireless sensor network for the reason is energy consumption and better utilization of available power in the network. In a clustering algorithm clustered heads gets information from its non clustered head with in group. Almost the clustered network only the information sharing between clustered head to clustered head. Route optimization technique is used to select a shortest path from the available path. We will discuss briefly about a loss rate and delivery rate, network lifetime, residual energy and more parameters.

EC technique: The important goal of this technique is used to elect clustered heads and form a complete network. Each cluster node send message to respective clustered head and these clustered heads send message to base station. Clustering architecture can e extended to greater depths hierarchically. The data gathered by all members of the cluster can be fused at the cluster-head, and only resulting information needs the communicated to the base station. Wireless sensor networks should be self-organizing, hence cluster formation and election of cluster head should be an autonomous and its distributed process. Initially all sensor nodes have equal energy we already seen clustered head election in a distributed manner. If any cluster elected as clustered head its sends the advertisement message to other sensor nodes.

Route optimization technique: This technique used to find shortest path in a network. In ROT we use Dijkstra's algorithm (DSP) to finding the shortest path between nodes. First we construct the complete network then consider the source node is A and sink is Z now the information forward from source to sink node with minimum cost.

Energy consumption calculation: Energy consumption is one of major factor in wireless sensor networks. EC is energy efficient clustered and EEC it's denoted as consumed energy of EC per execution in clustered network. EEROT it's denoted as consumed energy of Enhanced ROT per execution. Statement of experts in sleep mode energy consumption is very much less when compared

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with transmitting and receiving nodes. Energy per round is sum of energy consumed by EC and EROT paragraphs must be justified alignment. With justified alignment, both sides of the paragraph are straight.

E round=EEC+EEROT

We already discuss Energy consumption is very low at the sleep mode. In Practically more number of sensor node deployed at the network this can be increased the life time of the network. In a network most of the sensors nodes are set as sleep mode and the remaining sensor nodes are active mode this method also increased the network lifetime.

4. Results and discussion

4.1. Total packet loss ratio

The data packets are routing from one node to another node it had some packet loss during transmission so the packet loss typically caused by the network congestion and bad protocol selection. If transmission rate is greater than packet size then packet drops occurred. Packet loss reduced throughput and reliability of the network. The PLR is a Ratio of no. of packets loss by no. of packets sends so TPLR is

TPLR = (NO. of packets losses)/ (NO. of packets send)

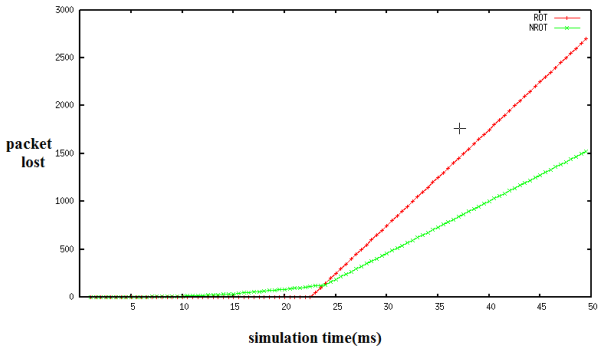


Fig. 1: Packet Loss Ratio.

4.2. Delay rate

The delay rate is always proportional to hop counts in a path. When hop counts decreased the delay rate also decreased. In location based routing protocol it has better delay rate than the other protocols. We already discuss the location based routing protocol first it find the location of the sensor node then only data going to be forward. It will be able to find sufficient path from available paths and delay rate is shown in fig 2.

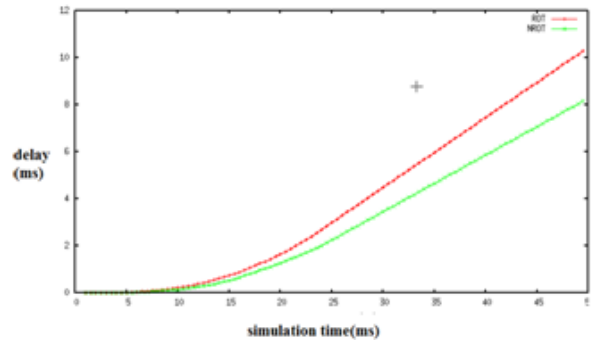


Fig. 2: Packet Loss Ratio.

4.3. Total packet delivery ratio

The PDR is a Ratio of no. of packets received by no. of packets delivered. When Total Packet Delivery Rate is increases as the hops count reduced. In a Location based routing protocol it has better delivery rate than the other protocols. The Total Packet Delivery Ratio shown in fig 3.

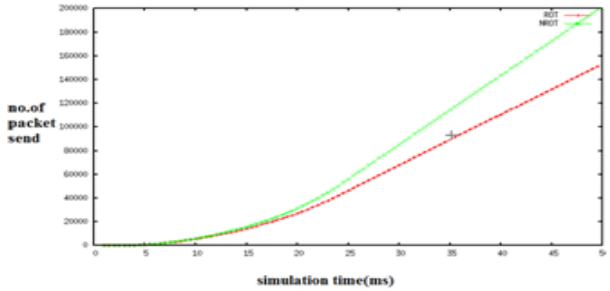


Fig. 3: Packet Delivery Ratio.

4.4. Residual energy

Residual energy means the remaining energy from available energy. When the information between nodes to node it consumes some amount of energy from available energy. we proposed the clustering algorithm every nodes are not responsible for the transmission and reception only the clustered head have a responsible for the transmission and reception .in our protocol it has better treatment about residual energy than others protocols. In location based routing protocol it has special treatment about the energy. The figure 4 given below shows the plot of Residual Energy.

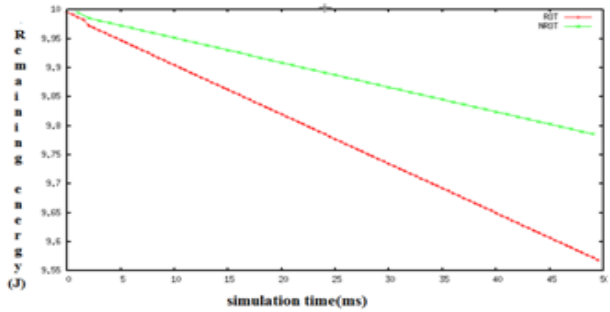


Fig. 4: Packet Loss Ratio.

4.5. Network lifetime

Life time of the network is an important parameter in a wireless sensor network. We already seen the clustering algorithm increased the network lifetime. We discuss from the output plot the location based routing protocol has better network lifetime than the other protocol. When the energy consumption increases, the lifetime of the network decreases. So we should propose an effective protocol to maximize the network lifetime. The Output plot of network lifetime shown in Fig 5.

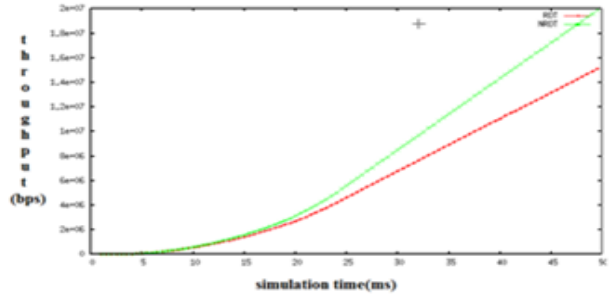


Fig. 5: Throughput.

In fig 6 the life time of the network is higher than previous protocol. In Enhanced ROT energy consumption per round is lower than the ROT.

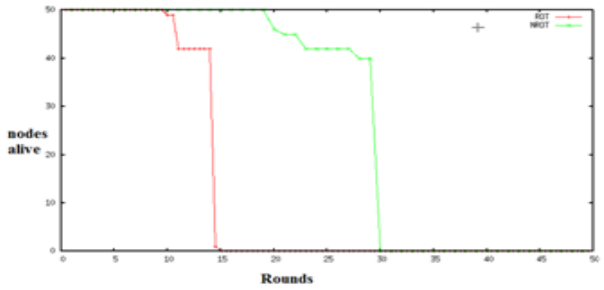


Fig. 6: Network Lifetime.

5. Conclusion

The major problems in wireless sensor network due to energy consumption, data loss and lifetime. The selection of effective routing protocols for a network can solve these issues by utilizing the resources efficiently. The simulation results shows that the proposed work has reduced delay improved lifetime, thereby increasing throughput.So we propose that location based routing protocol using clustering is efficient compared to previous mehods.

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