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DATA TRANSFER IN MOBILE WIRELESS SENSOR NETWORK

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***ABSTRACT*: Mobile wireless sensor is a sensor network consists of sensor nodes which are mobile. Data transmission in MWSN is not efficient and secure process. Lacking of throughput and more energy consumption leads to various several attacks. This should be considered and overcome the drawback in MWSN using efficient mechanism. Thus the data transmission in mobile wireless sensor network includes various techniques to exclude the drawback. The proposed model integrates four layers in the network operations. The location of the mobile nodes is embedded in the routing operation after the route discovery process. The location information is then utilized by the MAC layer transmission power control to adjust the transmission range of the node. This is used to minimize the power utilized by the network interface to reduce the energy consumption of the node(s).This model is further enhanced by minimizing more control packets such as RREQ packets and broadcast packets. And also implement a possible mechanism to find where the sink node is. Thus in this project an active monitor is used to select a neighboring node with higher energy. Further in multipath data transmission Directional Broadcast Flooding is implemented to find the best path in the network to transmit the data to the destination. Thus the proposed model increases the channel quality. And enhance the network life time and minimize the link error handling messages between nodes. Reducing control packet broadcasts between the nodes reduces the network's consumed energy. It also decreases the occupation period of the wireless channel. The model operation leads the network to consume less energy while maintaining the network packet delivery ratio.**

Key Terms: cross-layer operation , directional broadcast flooding , Mobile Wireless Sensor Network, mobile nodes.

1. INTRODUCTION

Mobility in Wireless Sensor Network is introduced because the nodes in this network are mobile nodes Sensor node mobility can be divided into two categories: limited mobility where there are specific nodes that roam around the network to perform an exclusive task (e.g., mobile sink nodes) and random mobility where the nodes (sensor nodes) roam around the area of deployment to collect the data needed for the application . Advantages of introducing mobility to the network are Applications , Topology and Network Connectivity.

Mobility can introduce a critical challenge to the operation of the deployed network if mobility is random. i.e., sensor nodes are also mobile in the network, the effect is greater as the network topology changes become rapid and that affects the connectivity of the nodes because we can't predict in which direction the mobile nodes will move. Topology changes have an effect on the routing operation as the links need to be rebuilt frequently; therefore, there is an increase energy consumption of the nodes. Mobility affects the MAC protocol operation because the connectivity can sufferfrom broken connections due to the transmission rangeof the wireless interface. The location of the sensor node(s) in random mobility is of importance because the sensed event is attached to the location of the sensor node[3].

2. EXISTING SYSTEM

In existing system SAMAC[2] is used, SAMAC is a cross-layer model that combines the slotted operation of the MAC protocol with the direction of the attached sectored direction antennas. It uses a different approach by using sectored antenna which helps in increasing throughput, delivery ratio and the energy consumption. Here the time schedule is computed centrally at the sink node and is then distributed to all other nodes which helps in improving the energy consumption and delay.

The communication interferences between the nodes are lowered because the communication is between the directional antennas as Omni-based antennas can infer higher interference.

Transmission power control is utilizes a TDMA-based MAC mechanism with a clustering routing algorithm. The transmission power control is achieved based on the path-loss characteristic of one hop between connected nodes. If the nodes are mobile, the transmission recalibration operation of the whole network has to be performed in a frequent manner. Drawbacks of existing system are it consumes more energy, decrease the network lifetime.

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3. PROPOSED SYSTEM

To overcome these drawbacks a new scheme is introduced a cross-layer operation model that can improve the energy consumption and system throughput of IEEE MWSNs. This project proposed a simple and efficient model for the effective cross layer model for the MWSN. It based on the two mechanisms the first one is to control the packets being broad cast. The second one is transmission power control. The transmission control is only active when the route is on .The cross layer model that is not efficient in each mechanism process.

The mechanism that should be implemented in each layer is important for the secure transmission.The proposed model integrates four layers in the network operation: 1) application (node location); 2) network (routing); 3) medium access control (MAC); and 4) physical layers. The location of the mobile nodes is embedded in the routing operation after the route discovery process. The location information is then utilized by the MAC layer transmission power control to adjust the transmission range of the node. This is used to minimize the power utilized by the network interface to reduce the energy consumption of the nodes. This model is further effective for the best of our knowledge.

4. SYSTEM OVERVIEW

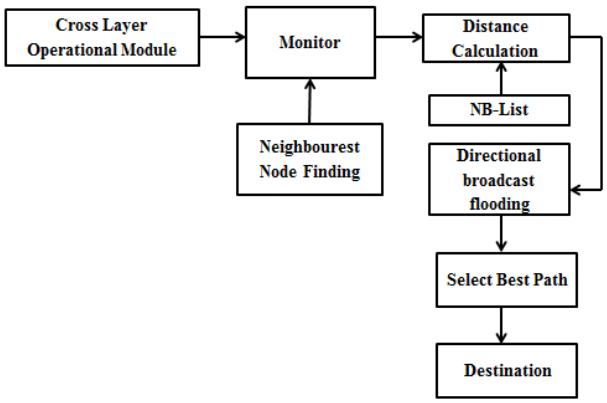

Figure 1 System Overview

In Figure 1, it shows the relationship between different components of system. The Cross-layer operational model integrates four layers which is used to perform different operations during the data transmission in WirelessPersonal Area Network.First the operations start by broadcasting Neighbour discovery packet which is used for Network Initialization.Before broadcasting Neighbour discovery packet don't know how many mobile nodes are there within a particular range, after broadcasting the Neighbour discovery packet it is easy to identify the mobile nodes in the network.

Monitor is used to identify the location of the mobile nodes in the network. All the collected information about the node such as location, distance between the mobile nodes are stored in a list named as neighbors' list (NB-List). Source will request for the location of sink node to the active monitor. Source starts transmitting the directional broadcast flooding towards the direction where the sink node is available. The best path is selected and the sink node transmit a unicast reply message. Based on the distance calculated the transmission power is adjusted. The operational model target application was mobile node tracking for social purposes. Mobile sensor nodes roamed around a fixed deployment area. The application environment is assumed as given below

1. The system was homogenous, i.e., the nodes had the same type of equipment and capabilities (Hardware and software).
2. All sensor nodes were mobile.
3. A stationary sink node was deployed in the network.
4. The deployment surface was flat.
5. A line-of-sight was present between the nodes in the transmission range vicinity of each other.

The propagation model utilized in the evaluation process was the Two-Ray Ground model as the nodes had a present line-of-sight and no obstacles in between. The Two-Ray Ground model had been used for evaluating mobile WSN operations in [5], [6], [7], [8], and [9]. The energy model that the nodes followed contained the following states: transmission power, reception power, idle/listening power, sleep power and state transition power.

5. MODULES

There are four modules they are

- Network Initialization
- Activity Monitoring
- Distance Calculation
- Data Transmission

Network Initialization

This is the first module that is used to set the topology in Cross layer Network. At network initialization, the mobile node started to broadcast a neighbor discovery message to initiate neighbor(s) information collection and store it in a neighbors' list (NB-List). After the initialization process, if a node in the network had data of interest to send,

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attached with this data was the location information of the mobile node.

Activity Monitoring

An active monitor is available in the network.Active monitor is selected based on the node which has the highest energy in the network. Active monitor is responsible for monitoring the actions of each and every node in the network. Active monitor has the information about the location of each and every node in the network. The source and sink node is selected based on the user needs, source node will ask for the location of the sink node to active monitor. Active monitor will specify in which direction the sink node. Active monitor knows the information about the sink node by the GPS module attached to each and every node in the network.

Distance Calculation

After receiving the response from the active monitor about the location of sink node. The source node starts transmitting the directional broadcast request message towards the direction of sink node in the network. After the destination node received the broadcast packets, it replied by sending a unicast route reply (RREP) packet. The destination node embedded its own location information in the RREP message and sent it back to the next hop node in the reverse route. The Figure given below illustrates the RREP packet structure after embedding the location information.

The next hop node in the reverse route calculated the distance between it and the destination node and exported this information to the data-link layer. The MAC protocol utilized the transmission power control-based. The distance between two nodes is calculated as the Euclidian distance between two points.

In Figure 2, it specifies the message structure of RREP packet; RREP packet is send back in reverse order in a unicast direction from the destination to source. While sending the RREP packet the information about the source is included in the packet with its IP address and location information. The size of RREP packet is 32 bits. A 32-bit field is required for the location information as it is relevant to theimplemented simulations. 16 bits for the X-axis and 16 bits for the Y-axis.It is possible to store the location information.

Type	[R|A]	Reserved	Prefix	Hop Count
Destination IP Address				
Destination Sequence Number				
Originator (source) IP Address				
Lifetime				
Location information				

Figure 2 RREP Message Structure

Data Transmission

The MAC protocol utilized the transmission power control based on the distance information and calculated the required power to use when sending data packets back to the destination node. Christo Ananth et al. [4] discussed about Reconstruction of Objects with VSN. By this object reconstruction with feature distribution scheme, efficient processing has to be done on the images received from nodes to reconstruct the image and respond to user query. Object matching methods form the foundation of many state- of-the-art algorithms. Therefore, this feature distribution scheme can be directly applied to several state-of- the-art matching methods with little or no adaptation. The future challenge lies in mapping state-of-the-art matching and reconstruction methods to such a distributed framework. The reconstructed scenes can be converted into a video file format to be displayed as a video, when the user submits the query. This work can be brought into real time by implementing the code on the server side/mobile phone and communicate with several nodes to collect images/objects. This work can be tested in real time with user query results.

The proposed system use only less amount of broadcast message for control packets for data transmission between the source and destination.

6. CONCLUSION

The proposed method is simple, intuitive yet highly effective cross-layer network operational model for MWSNs. The proposed model integrates four layers in the network operation: 1) application (node location), 2) network (routing), 3) medium access control (MAC), and 4) physical layers. The location of the mobile nodes is identified by the active monitor.

The network model employs two major mechanisms: the first is controlling the amount of control packets being broadcast in the network to provide a relief for the communication channel between the nodes. The control packet minimization process focuses on the broadcast packets, mainly neighbor, discovery mechanism at the MAC

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layer, the neighbor discovery packets (hello packets) at the routing layer and RREQ packets.

The second mechanism is transmission power control that is dependent on the node'(s') location. The transmission power control mechanism is only active when the route is established; therefore, it's effect is guaranteed at the data transmission state.

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