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EFFECTIVE AND ENERGY EFFICIENT NEIGHBOR DISCOVERY PROTOCOLS IN MANET

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***Abstract*--Neighbor discovery is an essential pace in wireless ad hoc network. In this paper, we Intend and examine several routing protocols for neighbor discovery in MANETs. Performance is investigated in both the symmetric and asymmetric case. Dynamic source routing is used to detect the shortest path among all neighbor nodes. To determine the energy efficiency of the node a new protocol commonly known as energy efficient Zigbee routing protocol is used. We propose sleep scheduling algorithm to determine the sleep state and active state of the nodes. By using those protocols the effectiveness and energy efficiency of the node is recognized for asynchronization case in MANET. The concert of the network is increased up to 90% in both the symmetric and asymmetric case.**

Index terms: asynchronization, energy efficiency, MANET, performance, routing protocols

I. INTRODUCTION

A Mobile Ad-hoc Network is an` anthology of autonomous mobile nodes that can communicate with each other through radio waves. A Mobile Ad-hoc Network has many free or autonomous nodes often unruffled of mobile devices or other mobile pieces that can organize themselves in various ways and operate without strict top-down network administration. A mobile ad-hoc network (MANET) is a network of mobile routers coupled by wireless links - the union of which forms a casual topology. The routers are free to move indiscriminately and organize themselves in a unsystematic manner so the network's wireless topology may perhaps change hastily and indeterminable. In MANET the concert of the network is based on nodes uniqueness like effectiveness, energy efficiency, transmission speed etc., the concert of the network is high if the nodes in the network satisfy the distinctiveness.

MANET characteristics: MANET network has an autonomous behavior where each node presents in the network; act as both host and router. During the transmission of data if the destination node is out of range then it posses the multi-hop routing. Operation performed in Manet network is distributed operation. Here the nodes can join or leave the network at any time. Topology used in MANET network is dynamic topology.

Routing protocols: Generally routing protocol is defined as a set of rules which regulates the transmission of packets from source to destination. These characteristics are maintained by different routing protocols. In MANET different types of protocols are used to find the shortest path, status of the node, energy condition of the node.

II. NEIGHBOR DISCOVERY PROTOCOL

Central servers can be engaged, proximity-based applications' potential can be better demoralized providing the capability of discovering close by mobile devices in wireless communication locality due to some reasons like users can enjoy the ease of local neighbor discovery at any occasion, although the federal service may be occupied due to unexpected reasons, a single neighbor discovery protocol can advantage various applications by providing more litheness than the centralized approach. Communications between a central server and different mobile nodes may persuade problems, such as unnecessary transmission outlay, clogging, and unpredicted reaction delay, penetrating for close by mobile devices locally is entirely free of charge. a dispersed neighbor discovery protocol for mobile wireless networks is tremendously needed to put into practice. Usually, there are three challenges in cunning such a neighbor discovery protocol.

Neighbor discovery is nontrivial for several reasons: Neighbor discovery needs to deal with collisions. Idyllically, a neighbor discovery algorithm desires to minimize the possibility of collisions and, therefore, the time to determine neighbors. In many realistic settings, nodes have no awareness of the number of neighbors, which makes cope with collisions even harder. When nodes do not have right to use a global clock, they have to activate asynchronously and at rest be able to determine their neighbors competently. In asynchronous systems, nodes can potentially initiate neighbor discovery at different times and, therefore, may miss each other's transmissions Furthermore, when the number of neighbors is unknown, nodes do not recognize when or how to conclude the neighbor discovery process. To evaluate the performance of our designs in one-to-one and group scenarios, not only conduct comprehensive simulations, but also sampling them using testbed. Evaluation results show that Diff-Codes drastically decrease the discovery latency in both the median case and worst case.

III. RELATED WORK

In [1] with the setting of a single-hop wireless network of n nodes, ALOHA like neighbor discovery algorithm is used to detect collisions. In [2] WiFi interface is known to be a primary energy consumer in mobile devices, and idle listening (IL) is the leading source of energy utilization in WiFi. Most existing protocols, such as the 802.11 power-saving modes (PSM), try to diminish the time depleted in IL by sleep arrangement. In [3] the increasing prevalence of multi packet reception (MPR) technologies was used .We study neighbor discovery in MPR networks that permit multiple packets to be recognized effectively at a receiver. In [4] efficiency, as it permits a near order of magnitude diminution of the organize time. Heftiness, because codes are short and easily detectable even at low SINR and even while a neighbor is transmitting data.

IV. PROPOSED SCHEME

New classes of neighbor discovery protocols were used to improve the performance in symmetric and asymmetric case. Energy consumption of the nodes was reduced to increase the life time of the network by using energy efficient Zigbee routing protocol. By using the sleep scheduling algorithm all the neighbor nodes in the network were kept in a sleep state except the transmitting nodes to save the energy.

V. PROTOCOL OVERVIEW

Dynamic source routing protocol DSR use source routing conception. The data packets collect the source route in the packet header.DSR uses route discovery procedure to propel the data packets from sender to receiver node for which it does not previously be familiar with the route it uses a route discovery method to actively establish such a route. DSR toil by flooding the packets in network with route request packets. Route request packets are received by every neighbor nodes and carry on this flooding process by retransmissions of route request packets, if it gets destination. Such a node replies to the route request with a route reply packet that is routed rear to real source node. Source routing uses route request and route reply packets. The route request builds up the pathway traversed diagonally to the network. The source caches backward route by reply packets for forthcoming use. If any association on a source route is ruined, a route error packet is notified to the source node. In common, the operations of a dynamic routing protocol can be described as; the router transmits and receives routing messages on its interfaces. The router distribute routing messages and information with other routers that are by means of the similar routing protocol .Routers swap routing information to gain knowledge about remote networks. When a router finds a topology alteration, the routing protocol can publicize this alteration to other routers.

Energy efficient Zigbee Routing protocol Zigbee Routing protocol are not just connected to reduce the total energy utilization of the route but also to take full advantage of the existence of each node in the network to expand the time of the network. The major principle of energy efficient algorithm is to continue the network functioning only if possible. In MANTEs energy utilization is ended in three states of the nodes which are broadcast in receipt of a sleeping state. Nodes guzzle more energy whereas transmit in a sleep state. Sleep state means nodes are inactive, in which they neither transmit nor receive any signals. More energy can be saved by trusting more nodes in sleep state.

VI. ALGORITHM OVERVIEW

Sleep scheduling algorithm All node has a unique id, and the message flanked by neighboring nodes is symmetric and bidirectional. It is also understood that the clocks of the sensor nodes in the WSN are coordinated so that nodes can be wake up almost at the same time.
The objectives of the sleep scheduling are as follows:
Nearly all nodes must be in sleep mode most of the time so that the energy utilization by each node is condensed. Utilization of energy by all the nodes remains balanced. Load distributed by each node should be equal so that no node is over used. Time required to transmit data from sender node to the receiver node should be as minimum as possible.

VII. PERFORMANCE EVALUATION

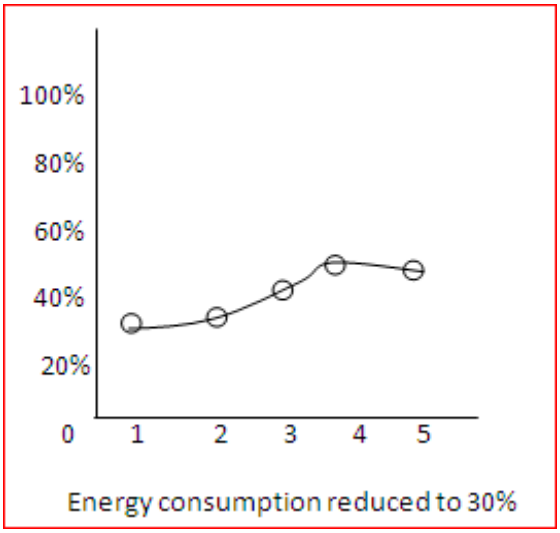

Fig 1: Energy consumption in symmetric and asymmetric case

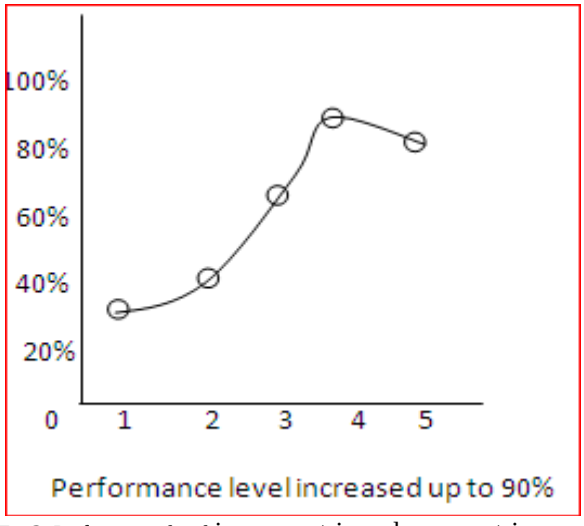

Fig 3: Performance level in symmetric and asymmetric case

Comparing with the existing system the energy consumption is reduced from 60%to 30%.similarly the performance level increased up to 90%

VIII. CONCLUSION

In MANETs energy consumption and performance are the main challenges. Here efficient routing protocols were used to improve the performance. Energy consumption is decreased so that the lifetime of the network is improved and the performance level is increased up to 90%.The performance gain is increased in both the symmetric and asymmetric case.

IX. FUTURE WORK

We have recognized the deviation path problem and traffic concentration problem of the ZTR. These are the basic problems of the general tree routing protocols, which source the overall network performance dreadful conditions. To conquer these problems, we suggest STR that uses the neighbor table, originally defined in the Zig Bee standard. In STR, each node can locate the best next hop node based on the enduring tree hops to the destination. The analyses show that the one-hop neighbor in sequence in STR reduces the traffic load concentrated on the tree links as well as provides an efficient routing path.

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