MODIFIED DSR PROTOCOL FOR ENERGY EFFICIENCY IN MANET WITH LOAD SHARING

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ABSTRACT

Mobile ad hoc network (MANET) is an infrastructure-less network where battery power of nodes limits the communication capabilities. For Routing purpose Dynamic Source Routing (DSR) protocol is largely utilized in and it is also beneficial in MANET. Modified DSR protocol is Energy Efficient protocol where energy consumption is minimized. It selects nodes which consume less energy. Load Sharing is to distribute load, so that no path gets heavily loaded or stays ideal. Because of load sharing failure of any path doesn't cause more loss of packet. In this work Load sharing mechanism in MDSR protocol is proposed, where energy efficient path will have data to transfer from source to destination.

Keyword:- *DSR Protocol, Energy efficiency, Load Sharing.*

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1. Introduction:-

1.1 MANET:-

MANET stands for "Mobile Ad hoc Network" which is a collection of wireless mobile hosts. MANET is forming a temporary network which requires no centralized administration or standard support services.
MANET is self-configuring, infrastructure-less network connected wirelessly of mobile devices. MANET nodes might not have any knowledge about the capabilities or services offered by each other [1]. Communication is done through multi hope paths. Each node in MANET acts as router those forward data packets to other nodes.
MANET has given rise to many applications like Wireless Sensor Network, Data Networks, Device Networks, etc [2].

1.2 Routing Protocols:-

Routing protocol is the important factor in the Mobile Ad-hoc Network [3] [4].
Different kind of routing protocol in MANET includes:-
Proactive routing protocol,
Reactive routing protocol and
Hybrid protocol.

Proactive Routing Protocols

Link state routing information is used by proactive routing protocol. Here all the nodes store the information about other nodes. All the nodes have to relay its entries to its adjacent node. It stores and maintains routing information by exchanging the control packet from each other (neighbor). Examples are OLSR, DSDV and WRP etc [5].

Reactive Routing Protocols

Overhead that are present in proactive routing protocol are reduced by reactive routing protocol. Distance-vector routing algorithm is used by which it establishes the route to given destination when a node requests it. Examples are DSR, AODV, etc [5].

Hybrid Routing Protocols

It is the combination of reactive routing protocol and proactive routing protocols. Where it also stores information of next node and also react only when a node request it by initializing route discovery process. Hybrid routing protocol example includes are ZRP, BGP, EIGRP.

1.3   Dynamic Source Routing protocol:-

Dynamic source routing protocol is simple and efficient. All aspects of protocol depend entirely on demand. Besides this it also makes the network self-organizing and self configuring without any need of existing infrastructure [6]. Primary characteristics of DSR includes that it is a source routing protocol which contain source routes that identify each node from the path to the destination. Source route is accumulated by Route request (RREQ) and route reply (RREP) packets by which once a route is discovered the source has the complete source route and can place that route into subsequent data packets [7].

Route Discovery:-

Route discovery is procedure to discover new route to send data from source node to destination node when a source have data to send to destination node.

Route Request:-

Route discovery is initiated by broadcasting route request (RREQ) packet. Address of source, address of destination, and unique identification number is included in RREQ packet. Each nodes check whether that packet is related to them or not. If not then they forward the packet to their neighbor. Route Request is forwarded by node that has not first appear in the route request table with the same identification number.

Route Reply:-

When the packet arrives the destination Route reply is generated. Sequences of hops, address of the intermediate node are stored in packet. If the destination node has route while replying in its route cache, it will use that route for route reply.

 Route Maintenance:-

Route maintenance is a procedure is to identify whether that link is capable of carrying packet on it or not and whether it is reliable. This process is done by the use of REP (route error packets) and acknowledgements given by receiver. Node returns the packet error message to the sender showing the path over which the packet could not be forwarded, if the packet is retransmitted by some number of nodes [8].

Advantages:-

- The entire route is contained in the packet header of each date packet which is sent from node to destination, so storing routing table inside each node is not needed.
- Multiple routes are allowed in DSR from source to destination and sender can select and control the route used in routing its packet.
- Route cache improves the performance of the protocol.
- Faster routing possible for real time application having low to end delay.

Disadvantages:-

- Broken link is not repaired by route maintenance mechanism.
- Due to source routing packet header size changes.
- Performance degrades in increasing mobility [9].

2. Modified Dynamic Source Routing Protocol:-

There are different methods and research done on energy efficient modified DSR protocol. In modified DSR protocol the nodes for transmission are selected which conserve less energy rather than taking into account minimum number of hop.

Paper Title	Publication	Year	Description
Nodes energy aware modified DSR protocol for energy efficiency in MANET.	IEEE	2015	In proposed algorithm routing protocol selects the node which consumes less energy rather than less number of nodes with high energy consumption.
Efficient Source Initiated Multipath Routing Protocol in MANET.	IEEE	2016	ESIM-DSR is an efficient route selection protocol which uses transmission as well as residual energy of a given path. Multipath are discovered with primary and secondary caches
A Novel DSR-based energy efficient routing algorithm for mobile ad-hoc networks.	IEEE	2003	The EDDSR mechanism is about excluding nodes which have fewer lifetimes from participating in the route discovery process.
Modified DSR, an energy conserving approach to DSR protocol in MANET.	IEEE	2014	Power is conserved while discovering a route and transmitting data in MANET using DSR protocol.

Minimum Energy Dynamic Source Routing Protocol for MANET	IEEE	2007	It uses minimum power for communication so that significant amount of energy can be saved, which decrease per packet energy consumption.
Modified Energy Saving DSR protocol for MANET	IJECSE	2013	MESDSR in MANET (modified energy saving dynamic source routing) which will utilize the battery power of the mobile node by which the network will get more lifetime.

Fig:-1 survey

3. Problem statement:-

Modified DSR protocol consume less energy compared to normal DSR. This assures selection of nodes are done which conserve less energy rather than selecting node which have less number of hop but consumes high energy. In MDSR protocol energy efficient path is discovered. If all packets are send from one particular path then possibilities of link failure or packet loss is high. So if packets are divided in multiple energy efficient paths then possibilities data loss can be reduce. Therefore Load sharing mechanism can be applied in MDSR protocol to distribute load among all selected path. So data will be distributed in selected path.

4. Conclusion:-

This proposed system has presented the routing protocol which will transfer data from every energy efficient path so that no path gets highly overloaded. LS-MDSR (Load sharing in modified DSR) shows good performance considering energy and transferring data to destination. Packet loss in transmission because of link failure will be reduced, because only packets transferring from that link will only be lost.

5. Acknowledge:-

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