NEW UNICASTING APPROACH IN DSR PROTOCOL

[1]. Harmandeep Kaur, [2]. Mandeep kaur, [3]. Harjinder Singh, [4]. Nikita

1. Student of M.Tech, Lovely Professional University, Jalandhar Punjab

2. Student of M.Tech, Lovely Professional University, Jalandhar Punjab

3. Student of M.Tech, Lovely Professional University, Jalandhar Punjab

4. Student of M.Tech, Lovely Professional University, Jalandhar Punjab

er.harmanmann@gmail.com, mandy.sandhu15@gmail.com, sidhuharjinder89@gmail.com, nikita.jindal17@gmail.com

Abstact - Dynamic source routing protocol is an on demand reactive routing protocol in which route selection is done on the basis of hop counts and sequence numbers. Route request packets are broadcasted throughout the network and the nodes which are having route to the destination will reply back with the route reply packets. This broadcasting technique increases traffic flooding in network hence reduces the network throughput. In this paper, we have proposed new unicasting approach in DSR in which the route request packets will be sending only to the specific nodes instead of all nodes. This approach will reduce flooding in network and will leads to enhancement in the network throughput as compared to the previous approach.

Keywords - **Throughput, Unicasting, Broadcasting.**

I. INTRODUCTION

Wireless adhoc network [1] is decentralized type of wireless network. It does not rely on preexisting infrastructure. Every node in this network participates in routing by forwarding data to other nodes. The forwarding of data by which node is determined is based on network connectivity. In addition to classic routing, wireless adhoc network uses flooding technique based on network connectivity. Mobile adhoc network is kind of wireless adhoc network that usually has a routable networking environment on the top of link layer adhoc network.

Mobile Adhoc networks (MANET) are self configurable network of mobile devices having no need of infrastructure [2]. All devices are connected by wireless. Each device in a MANET is free to move independently in any direction, and will therefore change its links to other devices frequently. Each must forward traffic which is not related to its on use and therefore act as a router. With the recent development of mobile adhoc networks, their estimated size will become large. So it is necessary to handle large mobile adhoc network resourcefully [4]

Mobile adhoc network works on two types of protocols: reactive protocol and proactive protocol. In Proactive protocols every node maintains one or more tables representing the entire topology of the network. These tables are updated regularly in order to maintain up-to-date routing information from each node to every other node. Reactive routing protocols are source –initiated protocols in which routes are established only when they are required. Reactive approach eliminated the need to periodically flood the network with table update messages which are required in a table driven approach (proactive). The need to find routes to all other nodes in the network as required in table driven approach is eliminated in reactive routing approach. The reactive routing protocols are AODV and DSR. AODV [5] is a reactive protocol in which routes are created and maintained only when they are needed if they are not need then the routes are not created and maintained. DSR is another type of reactive routing protocol in which the route is established from source to destination when required. The route request packets when

flooded in network, initially the header is empty. When any node forward route request packet to another node in packet header ten that node fills its entry in it. This will leads to packet header over flooded problem. High overhead involved in flooding during route formation is a limiting factor of dynamic source routing protocol when applied for mobile ad hoc network. In this paper we are dealing with this problem and trying to solve it with new unicasting approach.

The Literature review is written in section 2. In the section 3 we illustrated the details of DSR protocol. The section 4 we discuss new proposed approach. In the section 5and 6 conclusion and References are there.

II. LITERATURE REVIEW

D.B Johnson and D.A. Malt in the paper "Dynamic Source routing in Adhoc wireless networks" has defined DSR that allows mobile sources to discover path toward any desired destination dynamically . There are complete list of nodes in every data packet, which must be passed before it reaches the destination for future use. DSR can support fast network topology and service even asymmetric links; it can successfully find path and forward packets in unidirectional link environments [6]. C Perkins, E Belding and S.Das in the paper "Adhoc on-demand distance vector routing" explained that in AODV there are no periodic topology update packets as it is mechanism for on demand route maintenance, when ever link breaks; only those nodes which forward packet through those links must receive proper routing advertisements [5]. Sachin Dnyandeo Ubarhande in paper "Performance evolution of AODV and DSR routing protocol in MANET using NS2" has studied the comparison between the ad hoc on demand routing protocol and dynamic source routing found that if the speed of mobile node changes from low to high Dynamic Source Routing give the better performance in terms of less TCP packet dropping than Ad hoc on Demand Distance Vector Routing Protocol and if we consider hop metric as increasing the number of hops the AODV gives better result than DSR [7]. Gargi .R. in paper "Improving performance of Dynamic Source Routing protocol by optimization of neural network" Stated that neural network scheme is applied to improve the performance of the Dynamic Source Routing which increases the throughput. Their simulation results have shown that increasing the number of layers further may not improve the throughput. [8]

Sharmin Sultana in the paper "Enhanced- DSR: A new approach to improve performance of DSR Algorithm" has given new approach called E-DSR with two concepts: Reducing Route Request packet and Truncating the packet header length in DSR. Performance of E-DSR is important in respect of some simulation metrics such as Route Request and control packet overhead, and packet delivery ratio. Unlike other source routing protocols, the E-DSR adapts quickly to routing changes by decreasing the sending route request packet as well as reducing the packet length when the size of the wireless network is large enough. [4]

III. SIMPLE DSR WITH BROADCASTING APPROACH

In this simulation [9] scenario we have 7 nodes network in which node 0 is a source node and node 6 is a destination node

STEP 1: Node 0 broadcast RREQ packets (route request packets) to its neighbor nodes which are node 1 and node 2. Degree of node 0 is 2, means it broadcast RREQ packets to 2 nodes.

STEP 2: Now node 1 broadcast RREQ packets to its neighbor nodes which are node 0, node 2 and node 3. Degree of node 1 is 3, means it broadcast RREQ packets to 3 nodes.

STEP 3: Now node 2 broadcast RREQ packets to its neighbor nodes which are node 0, node 1 and node 4. Degree of node 2 is 3, means it broadcast RREQ packets to 3 nodes.

STEP 4: Now node 3 broadcast RREQ packets to its neighbor nodes which are node 1, node 4 and node 5. Degree of node 3 is 3, means it broadcast RREQ packets to 3 nodes.

STEP 5: Now node 4 broadcast RREQ packets to its neighbor nodes which are node 2, node 3, node 4 and node 6. Degree of node 4 is 4, means it broadcast RREQ packets to 4 nodes.

STEP 6: Now node 5 broadcast RREQ packets to its neighbor nodes which are node 3, node 4 and node 6. Degree of node 5 is 3, means it broadcast RREQ packets to 3 nodes.

Out of these steps, step5 and step 6 find the destination node, in step 5 path from source to destination is (0-1-3-5-6) and in step 6 its (0-2-4-6) which is shorter then step5's path . So it chooses step6's path.

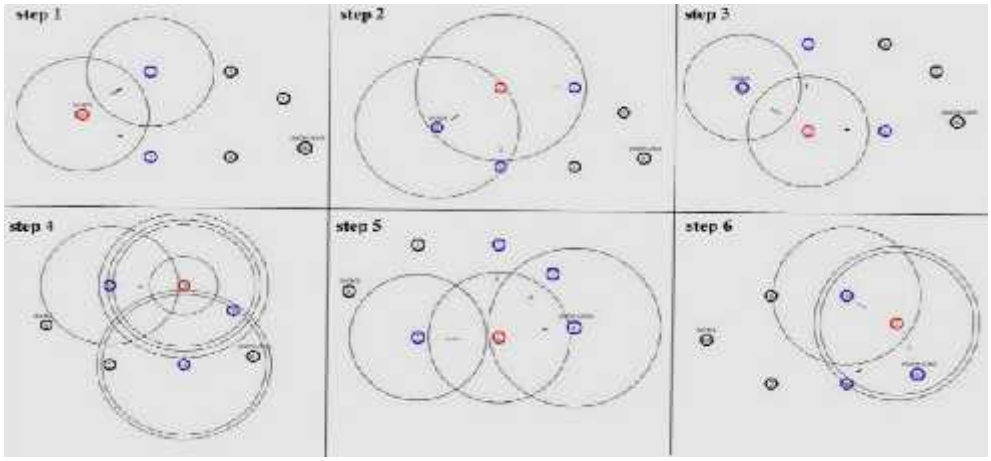

Fig 1: Working of simple DSR

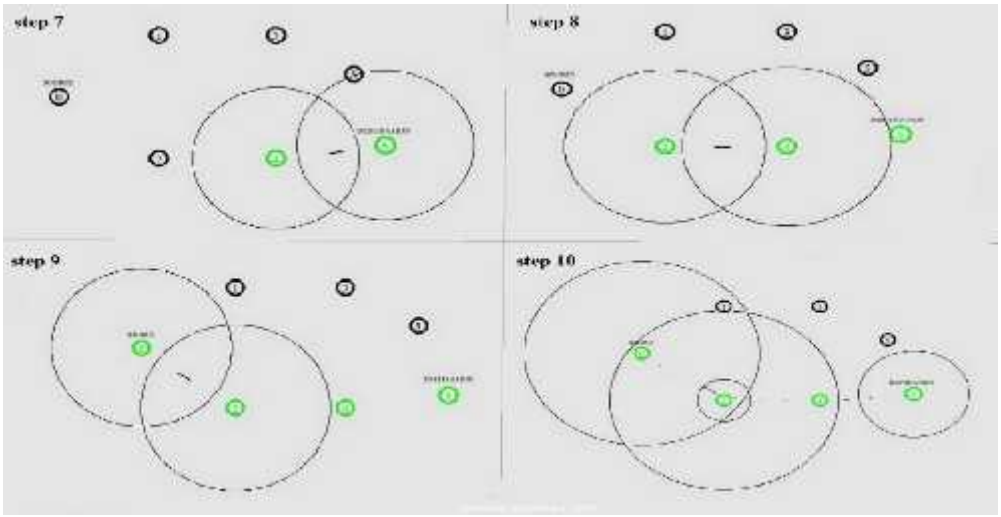

Fig 2: Path establishment in simple DSR

STEP 7: Node 6 reply RREP packets (route reply packets) to node 4.

STEP 8: Node 4 reply RREP packets (route reply packets) to node 2.

STEP 9: Node 2 reply RREP packets (route reply packets) to node 0.

STEP 10: Path is established between node 0 and node 6 and communication is started.

IV. NEW PROPOSED APPROACH

New approach is based on assigning priority to networking nodes. Priority can be assigned through Data routing table [9]. The Data routing information (DRI) tables are

established by the neighboring node in the network. The DRI tables have two entries

- Through Entry.
- From Entry

1. **Through Entry:**
   This entry indicates how many times packets have been successfully transferred by neighboring node of sending node. If neighboring node transfers the packet send by its previous node successfully to the node which is maintaining table of that node then value is set to "1" in "through" entry of DRI.
2. **From Entry:**
   This entry indicates how many times self generated data packet has been received from neighboring node. Node acting as a inter- mediator can also act as source node for sending its self-generated data. Value is set to "1" in "from" entry of DRI table if node has successfully received data from that neighboring node which is now acting as source node.

The simulation results showed in the figure 3 shows working of DSR with unicasting approach. Figure 4 and 5 shows that proposed approach is more efficient than the previous approaches.

V. WORKING OF DSR WITH UNICASTING APPROACH

STEP 1. Mechanism of assigning priority is going between nodes.

STEP 2. Priority has been assigned to all nodes.

STEP 3. Node 0 is sending route request packet to only node 1 after finding node 1 has highest priority over node 2

STEP 4. Again node1 send routing request packet to its neighbor node with highest priority i.e. node 5.

STEP 5. Similarly node 5 is sending route request packet to node 8 finding node 8 has highest priority over node 9.

STEP 6. Now node8 send routing request packet to node 10 after finding it destination node.

Due to one to one connection only one route for sending data can be generated. The mechanism of sending route reply packet for path establishment is same as in simple DSR.

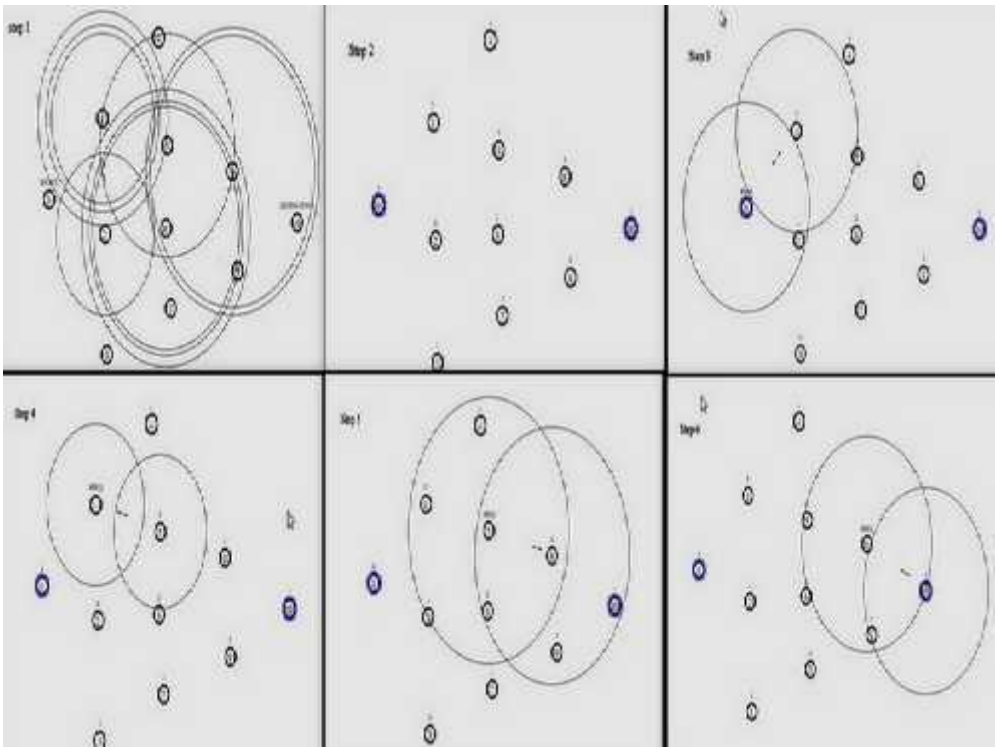

Fig 3: Working of DSR approach with unicasting approach

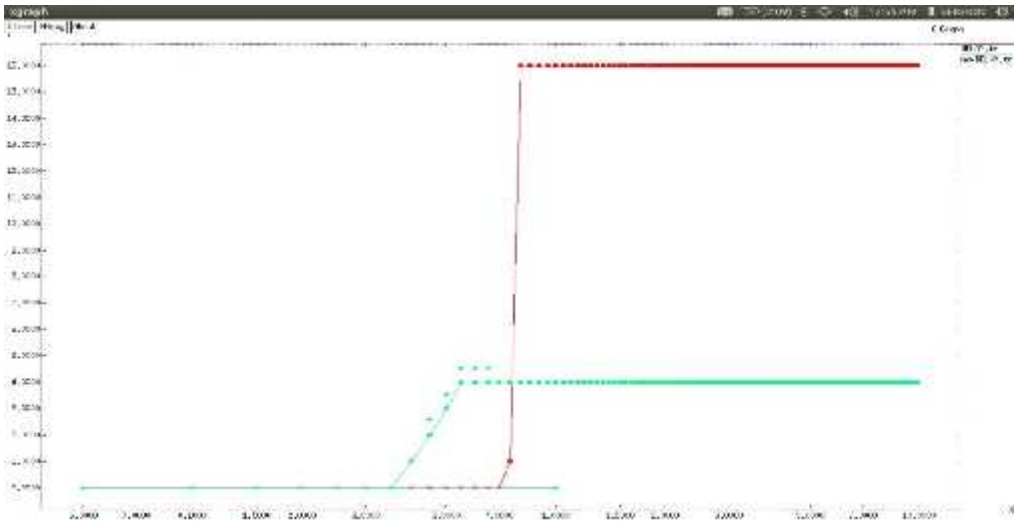

Fig 4: Delay in network

The red line in figure 4 shows the delay in previous technique and green line shows the delay in network with proposed technique .

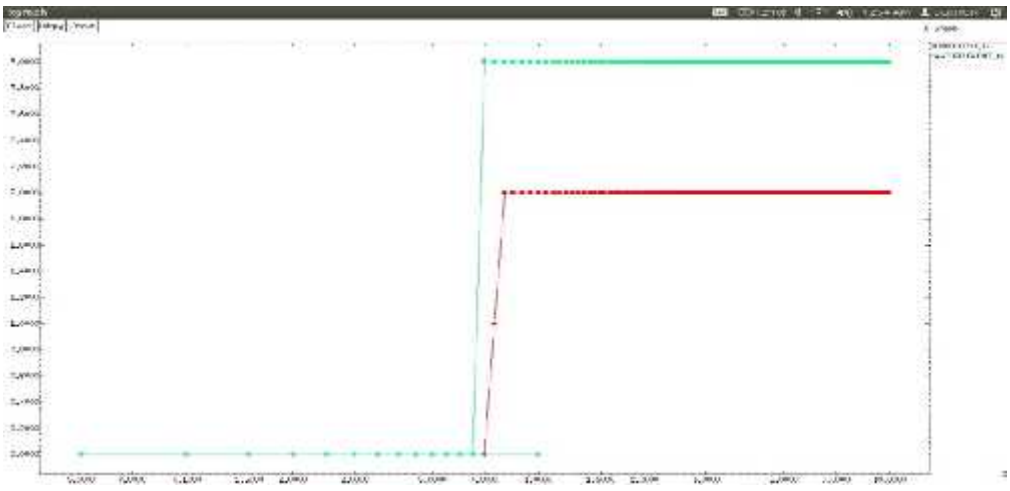

Fig 5: Network throughput

The red line in figure 5 shows the throughput of the previous technique and green line shows the throughput of network with the proposed technique.

VI. CONCLUSION

In this paper, we concluded that DSR protocol is much efficient protocol for route establishment. Due the

broadcasting technique of DSR protocol the throughput of the network gets affected. Our new proposed approach of unicasting the route request packets results in enhancement in the throughput of network. Moreover resource wastage (battery consumption) gets reduced due to sending routing request packet to specific nodes instead of all nodes in network. The simulation results show that proposed approach is more efficient than the previous approaches

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