A Review on Multicasting in MANET using AODV Protocol

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Abstract— The mobile adhoc networks is the decentralized type of network and mobile nodes can join or leave the network any time. In such type of networks routing is the major issue which is raised in the network. In the previous times various technique are proposed which works on the concept of broadcasting. The broadcasting leads to increase in network delay, reduction in network throughput and increase routing overhead. The multicasting techniques are used for path establishment from source to destination. In this work, various multicasting techniques has been reviewed and compared on the basis of various parameter.

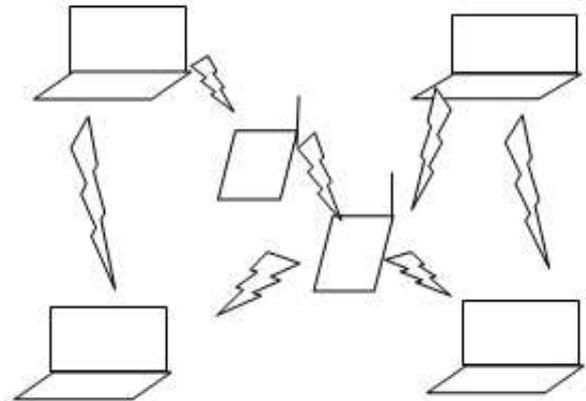*Key words:* MANET, Throughput, Delay, Multicasting Techniques

I. INTRODUCTION

Wireless networks are computer network that are not connected by any cables. With the use of a wireless network, we can avoid the cost of cables for connecting .Wireless networks use radio waves to connect devices such as laptops to the Internet.

A. Types Of Wireless Network:-There Are Three Types Of Wireless Network:

1) MANET:
MANET stands for Mobile Ad hoc Network. It is a continuously self-configuring, infrastructure less wireless network of mobile device which are connected without wires.

2) WSN:
wireless sensor network is used to sense the physical or environment conditions like temperature, pressure etc. Battery power of sensor node are limited because of small size of sensor node[2].

3) VANET:
VANET is used for the communication among the mobile vehicles. Thus the communication being carry on even if the vehicles are moving in different direction with in a particular area.

B. Manet:

MANET stands for Mobile Ad hoc Network. It is a infrastructure less wireless network. It can be formed either by mobile nodes or by both fixed and mobile nodes. Nodes are randomly connected with each other and forming arbitrary topology. They can act as both routers and hosts. As MANETs are illustrate by limited bandwidth and node mobility, there is demand to take into account the energy efficiency of the nodes, topology changes and unreliable communication in the design[4].

Fig. 1: MANET

C. AODV Protocol:

AODV is an on-demand routing protocol used in ad hoc networks. In case when a link fails, messages are sent only to the affected nodes. AODV has low memory overhead, builds unicast routes from source to the destination and network utilization is less. AODV defines three messages: Route Requests (RREQs), Route Errors (RERRs) and Route Replies (RREPs). These messages are used to discover and maintain routes across the network from source to destination[11].
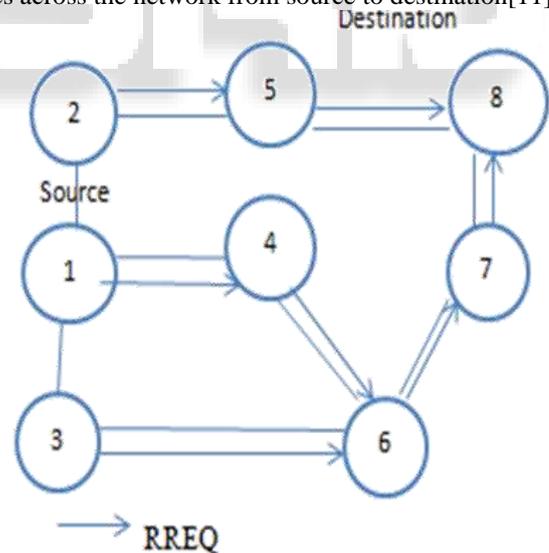

Fig. 2: Route Request

In this diagram, we can send the packet from source to destination by sending the route request. Node1 can send Route Request to node 4 and node 4 again send the request to node6 and further process continue. Any node can send the data to destination but with minimum hop count and maximum sequence number.
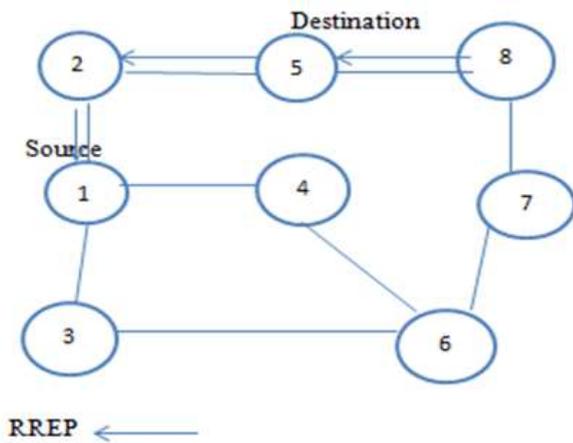
Fig. 3: Route Reply

In this diagram, we show the route reply process. we send the data from source to destination ,the adjacent nodes of destination which have direct path to destination will reply back with the R_REP. with this process we select the best path among all the available path on basis of hop count and sequence number.

II. LITERATURE REVIEW

1) Dhanalakshmi Natarajan1 and Alli P Rajendran explained [11] that Mobile ad hoc networks (MANETs) are highly vulnerable to both link and node failures due to nodal mobility. The routing resilience against link and/or node failures needs to be enhanced to avoid the degradation of network performance. This can be achieved by multipath routing which uses multiple alternative paths to route the messages via multiple disjoint paths and result in increased bandwidth, fault-tolerance, and security.

2) Limin Tang explained [12] multicast transmission offers a bandwidth efficient solution for delivering media content to multiple destinations over the Internet. However, in many existing networks, some nodes do not support multicast, In this paper, the authors propose an algorithm for multicast tree computation in networks with multicast incapable nodes. In this two procedure for traverse path computation are presented and their advantages in terms of complexity and solution optimality.

3) LI Xut introduced that [13] Mobile Ad hoc Networks play an important role in emergency communications where network needs to be constructed temporarily and quickly. Since the nodes moves randomly, routing protocol must be highly effective and successfully packet delivery. In this , tree-based have highest forwarding efficiency and low consumptions of bandwidth. As tree-based multicasting routing protocol, MAODV shows excellent performance.

4) Ting Lu and Jie Zhu [15] consideration of energy consumption in wireless ad hoc networks prevents the problem of the network exhausting batteries, thus partitioning the entire network. Power-aware multicasting is proposed to reduce the power consumption.

5) Arush Gadkar examined [14] that with the increasing number of high-bandwidth applications, energy consumption of networks has become an important issue

that needs to be addressed. Manycasting must be implemented as an overlay to optical layer. They propose two overlay approaches: MA-DAMN and MA-DAAN. The main aim of these approaches to minimize the number of wavelengths required to reduce the energy consumption.

III. MULTICAST TECHNIQUE FOR REAL TIME TRAFFIC

In the technique, cluster head selection is done using ENB algorithm. The cluster head is selected based on the parameters like residual energy, bandwidth and node connectivity. The new cluster head will be elected when any one parameter value is reduced below the threshold values. The multimedia traffic is split using the Top-N rule selection approach algorithm when cluster head is elected. The shortest path multicast tree is established to send multimedia data to different receivers.

In this we have two phases:
1) Route Request
2) Route Reply

A. Route Request Phase:

When any node contains multimedia data to be transmitted, route discovery is initiated by sending R_REQ. Source node can send the data to destination by sending the R_REQ. If source node does not receive a R_REP within the time then it broadcasts the another R_REQ messages. If R_REP is not received after several attempts then source node concludes that multicast tree is not reachable .So, the respective node become multicast group head.

B. Route Reply Phase:

If the source node receives a R_REQ for a multicast group, it replies with R_REP message if its sequence number is greater than the sequence in R_REQ. After receiving the R_REP source node update its route cache.

IV. TABLE OF COMPARISON

Author	Year	Description	Outcomes
Dhanalakshmi Natarajan1 and Alli P Rajendran	2014	Mobile ad hoc networks (MANETs) are highly vulnerable to both link and node failures due to nodal mobility.	increased bandwidth, fault-tolerance, and security.
LI Xut	2014	Mobile Ad hoc networks plays an important role in emergency communication where network needs to be constructed temporarily and quickly.	Tree based multicast routing protocol have high forwarding efficiency and low consumption of bandwidth.

Limin Tang, Wanjun Huang, Miguel Razo, Arularasi Sivasankaran, Marco Tacca, and Andrea Fumagalli	2012	Multicast transmission offers a bandwidth efficient solution for delivering media content to multiple destinations over the Internet.	It presented advantages in terms of complexity and solution optimality.
Ting Lu and Jie Zhu	2011	energy consumption in wireless ad hoc networks prevents the problem of the network exhausting batteries, thus partitioning the entire network.	Power-aware multicasting is proposed to reduce the power consumption. This present an energy efficient genetic algorithm mechanism to resolve QoS multicast routing problem.
Arush Gadkar	2011	increasing number of high-bandwidth applications, energy consumption of networks has become an important issue.	Aim to minimize the total number of wavelength required to service the manycast request set in an effort to reduce network energy consumption.

Table 1:

V. Conclusion

In this work, it is being concluded that multicasting is the more efficient technique of routing than broadcasting in terms of routing overhead, throughput and delay. In future improvement will be proposed in tree based multicasting topology to reduce chances of link failure which leads to increase in network throughput.

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