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Survey on Performance analysis of an Enhanced AODV Routing Protocol

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Abstract- This Paper has proposed modified AODV protocol, which is designed to improve the performance of Mobile Ad Hoc networks. This paper describes the characteristics, working and deficiency of AODV routing protocols, and proposed idea of modifying AODV routing protocol (MAODV). Basic idea of developing the MAODV is to select the path with less congestion and avoiding the congested root so that less packet dropping may due to congestion in mobile ad hoc network

Keywords- Mobile Ad hoc Networks, routing protocol; Ad Hoc on-demand distance vector

1. INTRODUCTION

Mobile Ad Hoc Network (MANET) is multi-hop, self-organizing, mobile wireless networks. The MANETs can be rapidly deplorable due to the absence of any fixed infrastructure. Applications of MANETs are at special events such as conferences, military operations, and other tactical applications such as emergency rescue or exploration missions, where a network infrastructure is unavailable or not reliable. These types of networks are characterized by the highly dynamic topology and the very limited resources of bandwidth and computational power. Routing is one of the primarily issue in mobile ad-hoc network. Routing is the process of transmitting information packets and messages across a network from a source node to a destination node. Routing of packets involves two basic activities: determining optimal routing paths and transporting message packets through network. An effective routing mechanism can be helpful to extend the successful deployment of mobile ad-hoc networks. Basically, routing protocols can be divided into two categories: proactive and reactive. The proactive protocols, such as Destination Sequence Distance Vector (DSDV) [1], periodically disseminate routing information among all the nodes in the network, so that every host has the up-to-date information for all possible routes. On reactive routing protocols, such as Ad hoc On-Demand distance Vector (AODV) [2], operate on demand basis, discover and maintain only active route that are currently used for delivering data packets and in this work will be focus on the AODV protocol. Abolhasan et al. [3] have reviewed the current routing protocols that have been proposed for MANETs. Proactive protocols periodically disseminate routing information from each node to each other node, and find routes continuous manner, whereas reactive protocols find routes only basis of on demand, i.e. only when a source sends information for forwarding to a destination. Performance analysis shows that, in general, reactive protocols outperform proactive protocols.

2. NETWORK PEFROMANCE PARAMETRS

1. **Throughput:** Per unit time number of packet received by the receiver, is being represented by-

$$Throughput = \frac{\text{No of packets received}}{\text{Time}} \quad \text{. (i)}$$

2. **Packet delivery ratio:** Packet delivery ratio is a percentage of data receiving by the genuine receiver. It is formalized by-

$$\text{PDR} = \frac{\text{Received Packets}}{\text{Sent packets}} * 100 \ \ldots\ldots\ldots\ldots\ldots\ldots \text{(ii)}$$

3. **Routing over head:** Normalized routing load provide the over head arises in the network and its calculation by-

$$NRL = \frac{\text{Routing packets}}{\text{Actual received packets}} \quad \text{……..(iii)}$$

4. **Drop data:** Data drop is measure in packet base and that calculation is formulized by-

Drop data = Total no of packets sent – Total no of packets received …….(iv)

5. **Average E-E delay:** The average end to end delay is a summation of per packet delay.

$$\text{Avg E} - \text{E Delay} = \sum_{i=0}^{n} \text{Ei} \quad \text{…….(v)}$$

Where,

Ei= End to End delay of i^{th} packet

n= Number of packets

3. AD HOC ON-DEMAND DISTANCE VECTOR ROUTING

AODV routing protocol is a typical demand-driven routing protocol, which combines the features of DSR routing protocol and DSDV routing protocol [4], It borrowed the DSR route discovery and route maintenance in the own foundation program, and the DSDV by hop (Hop-by-Hop) routing, the destination sequence number and the route maintenance phase of the cycle update mechanism, the bases of DSDV, combined with the DSR on-demand routing ideas and improvements. ADOV routing protocol use Route Request (RREQ), Route Reply (RREP) and Route Error (RERR) as a control signal.

3.1 Discovery route

When a source node need to communicate with some destination node and does not have a valid route there to destination. it initiates a route discovery method to locate the destination node by broadcasting a RREQ packet to its neighbors, which are then forward the request to their neighbors, and so on, till either the destination or an intermediate node with a "fresh enough" route to the destination is found. During the whole process of forwarding the RREQ, intermediate nodes record their route tables the address of the neighbors from which the first copy of the broadcast packet is received, thereby establishing a reverse path. If additional copies of the same RREQ are later received, these packets are discarded. Once the RREQ reaches the destination or an intermediate node with a fresh enough routes, the destination/or the intermediate node responds by uni-caste a RREP packet back to those neighbor from that its initial received the RREQ.As the RREP is routed back on the reverse path, nodes along this path started forward route entries in their route tables, that purpose to node that the RREP came. These forward route entries indicate the active forward route, related to every route entry is a route timer which is able to cause the deletion of the entry if it's not used among the specified lifetime. As a result of RREP is forwarded along the path established by the RREQ, AODV only supports the employment of symmetric links.

3.2 Maintenance route

AODV routing protocol uses RERR packet once link failure, the RERR from a broken communication link to the corresponding routing source node. The next hop link disruption, RERR packet to the neighboring node, destination node communication links broken links starting node. Once a node becomes inaccessible next hop node, then link it to the active use of the harm to the upstream node to send RERR packet, The RERR packet with a new serial number and the number of hops is set to 2. Node receives the RERR packets can then successively forwards the packet to their respective RERR active neighbors, this method continues till all links with the damage related with the active nodes have been notified so far. Source node, once receiving notification of broken links, then it contact with the destination node, it has to re-Launch a new route discovery process. At this time, it will broadcast a RREQ packet, the main purpose of this RREQ packet sequence number in the source node to the last known destination sequence number plus 1 above, to make sure that those that do not know the most recent position within the middle of the destination node of this node RREQ packet to respond, thereby ensuring the establishment of a new, efficient routing.

4. RELATED WORKS

Zuhong Feng, et al proposed a mechanism named improved routing protocol Ad-AODV supported AODV [7] to enhance AODV routing protocol that doesn't contemplate the residual energy and therefore the load scenario of the nodes once selecting routes, its potency declines sharply within the case of the high load and fast-paced speed. to unravel the on top of issues, author has projected improved protocol Advanced-AODV (Ad-AODV) of the AODV routing formula supported load equalization and a technique of energy model. Once Ad-AODV routing protocol performs the route request, it'll contemplate the load scenario and residual energy of nodes. The simulation results of the Ad-AODV routing protocol improves the throughput of network, and therefore the packet delivery ratio, reduces the routing load and lowers the average end-to-end delay.

Ling Liu, et al [8] proposed, a new mechanism QoS-aware routing protocol supported AODV named QAODV (QoS- AODV). Under the premise of the delay and out there information measure meeting the QoS demands, the protocol defines a new route metric with the hop count and load rate thus on choose the simplest route consistent with it. During this paper results show that, as compared with AODV, the performance of QAODV is better in each network throughput and end-to-end delay with little increase of control overhead.

Li Yuanzhou, et al proposed a mechanism optimization Strategy for Mobile ad hoc Network supported AODV Routing Protocol [9] during this paper performance is optimized on the idea of optimization of route discovery method, in this, the intermediate nodes handle the received packets consistent with their load state, their load state are often determined by calculation of the common queue length in Random Early Detection [RED]. Once node receives RREQ packet consistent with the strategy of RED, set a most and minimum threshold for decision making the handle methodology of RREQ packet early. Consistent with the various network atmospheres, parameter values ought to be adjusted accordingly.

S. Sridhara, et al [10] discusses the final AODV routing issues like long route, time delay, quality and lots of others whereas routing. Because of low energy within the nodes, it will not be during a position to complete the routing. Then the QoS parameters like turnout, PDR and delay area unit affected directly. The projected Energy based mostly AODV protocol (EN-AODV) announces energy and supported nodes causing and receiving rates and therefore the sizes of the info to be transmitted it justifies whether or not its energy is maintained or attenuated. It calculates the energy levels of the nodes before they're designated for routing path. A threshold price is outlined and nodes area unit thought-about for routing providing its energy is on top of this threshold price. The work is enforced and simulated on NS-2. The simulation results have shown a rise in PDR, decrease in delay and turnout is maintained. The projected EN-AODV provides additional consistent and reliable knowledge transfer compared to general AODV.

5. PROPOSED WORK

In the proposed method we have added a mechanism to ignore the congested route and forward the packets on alternative route if RREQ packet if their exists the congestion on that route, this add some additional delay thus the RREQ packet on congested route and RREP received from non congested route will receives faster than congested route. available. This is done by adding some delay on

6. EXPECTED RESULTS

This paper has proposed a new idea of modified AODV protocol for mobile ad hoc networks which works on the idea of selecting the path with less congestion and avoiding the path with congestion. This idea will effective to reduce the congestion using alternate path if exists, thus the packet drop

will reduce and re-forwarding of dropped packet will be also less. This proposed mechanism will consume the resources which is critical in these types of network.

References

[1] Perkins, C.E. and Bhagwat, P. "Highly Dynamic Destination-Sequenced Distance-Vector Routing (DSDV) for Mobile Computers".ACM Special Interest Group on Data Communications (SIGCOMM). (1994).

[2] Johnson, D. B. and Maltz, D. A. (1998). "Dynamic Source Routing in Ad Hoc Wireless Networks", In: T. Imelinski and H. Korth eds., Mobile Computing, Norwell, Mass., Kluwer Academic Publisher, pp. 151–181.

[3] Abolhasan, M., Wysocki, T. and Dutkiewicz, E, "A review of routing protocols for mobile ad hoc networks", Ad Hoc Networks 2(1), January 2004, pp. 1–22.

[4] Ling Liu, Lei Zhu, Long Lin, Qihui Wu, "Improvement of AODV Routing Protocol with QoS Support in Wireless Mesh Networks", 2012 International Conference on Solid State Devices and Materials Science, in Elsevier B. V., 2012.

[5] Ashish Bagwari, Raman Jee, Pankaj Joshi, Sourabh Bisht,"Performance of AODV Routing Protocol with increasing the MANET Nodes and it's effects on QoS of Mobile Ad hoc Networks", 2012 International Conference on Communication Systems and Network Technologies, 2012, IEEE.

[6] Zuhong Feng, Long Wang and Xiujuan Gao, "An improved routing protocol Ad-AODV Based on AODV", International Conference on Information Science and Computer Applications (ISCA 2013) Published by Atlantis Press. 2013.

[7] Zuhong Feng, Long Wang and Xiujuan Gao, "An improved routing protocol Ad-AODV Based on AODV", International Conference on Information Science and Computer Applications (ISCA 2013) Published by Atlantis Press. 2013.