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A Review of Routing Protocols for MANET

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***Abstract*— A Mobile Ad-Hoc Network (MANET) is a collection of wireless mobile nodes forming a temporary network without using any centralized access point, infrastructure, or centralized administration. Data transmission between two nodes in MANET's may be requires multiple hops as the nodes transmission range is limited. Mobility of the different nodes makes the situation even more complicated. Multiple routing protocols especially for these conditions have been developed during the last few years, to find optimized routes from a source to some destination.**

Ad-hoc network suffer from the lot of issues i.e. congestion, Throughput, delay, security, network overhead. Packet delivery ratio is the issues of ongoing research.

This survey gives a comprehensive overview of AODV (Ad-hoc on demand Distance Vector Routing) detailed comparison of different research on AODV has been presented. Open research direction is also discussed to serve as a starting point to future protocol design and evaluation.

KeyWord: MANET, Routing protocol, AODV.

1. INTRODUCTION

In AODV (Ad-hoc on demand Distance Vector Routing) [1], the network [2] is silent until a connection is needed. At point of time when a node needs to stablish a connection broadcasts [3] a request Root Request Packet (RREQ) [4] for connection. Other nodes of AODV forward this message, and record the node that they heard it from, creating an explosion of temporary routes back to the needy node. When a node receives such a message and already has a route to the desired node, it sends a message backwards through a temporary route to the requesting node. The needy node then begins using the route that has the least number of hops through other nodes. Unused entries in the routing tables are recycled after a time.

When a link fails, a routing error is passed back to a transmitting node, and the process repeats.

2. LITERATURE REVIEW

We have study many relevant papers and found very valuable information regarding our study. Some are given here. Jagpreet et-all presented enhanced local repair AODV that is based on the local repair Strategy where unicast mechanism has been introduced to improve the routing overhead by making mobile nodes aware of local connectivity. It extended the HELLO packet to NHellow this extra information helps AODV to repair the route by unicast instead of broadcast. The outcome of this research ELRAODV performs better than classic AODV in term of the congestion and end to end delay. Habib-ur Rehman et-all [2] is introduced a mechanism in which nodes are aware of its neighbor nodes. This information is utilized in routing operation like route request, route reply and route error operation. The outcome of this research it greatly reduces the routing overhead and MAC overheads. Shaily Mittal et-all [3] compared various routing protocols and identify the drawbacks of each one of them. Research shows a comparison of different routing protocols like AODV, DSR and ZRP over different parameter like an average end to end delay, TTL based hop count and packet delivery ratio. Sung-Ju Lee et-all [4] proposed an algorithm that establishes the 'mesh and multipath without transmitting any extra control message. In this protocol we use a new style of routing called "on-demand" routing has been proposed for ad-hoc networks. The scheme can be incorporated into any ad

hoc on-demand unicast routing protocol to improve reliable packet delivery in the case of node movements and route breaks. Azzedine Boukerche et-all [5] presented an extensive simulation studies to compare three on-demand ad-hoc routing protocols, DSR, AODV, and CBRP using a variety of workloads such as mobility, load and the size of the ad hoc networks. Results indicate that the two source routing based protocols, DSR and CBRP, have very high throughputs while the distance-vector based protocol, AODV, exhibits a very short end-to-end delay of data packets. Neda Moghim et-all [6] tried to reduce AODV's routing load by preventing AODV from relying on route request flood more often in the route discovery process. The simulation showed that using source routes in the route discovery process can reduce routing overhead and delay of routing in a high number of connections and high speed of movement. Q. Wang et-all [7] presented new scheme AODVRR (Ad Hoc On-demand Distance Vector Protocol with Redundant Routes) with improved robustness. The paper explores the approaches to improve the robustness of exiting MANET routing protocols. WC develop a new scheme AODV-RR theme builds multiple mutes for each Source destination pair and supplies immediate backup mute to salvage traffic flows at the point of link failures. Yusuke Sakurai et-all [8] introduces novel on-demand multipath routing protocol for MANET which combines the metrics of delay , hop count and disjointness , each intermediate node deliberately selects multipath candidates while contributing to suppression of unnecessary routing packets. The outcome of this research has higher packet delivery ratio and lower routing packets. Dr. S. A. Husain et-all [9] showed that If a node in a mobile ad hoc network aware of the mobility of the neighbor nodes then highly mobile node is to avoid becoming a part of routes, this will greatly reduce new path discovery towards the destination. Greatly reducing the new path discoveries and it increases the network throughput and performance**.** Alexander Klein et-all [10] compared various proactive routing protocols like SBR, AODV, and OLSR in various mobile scenarios with different traffic pattern. The outcome of this research shows SBR achieve high end to end reliability without frequent end to end route calculations. Chia-Ching oi et-all [11] proposed AODV-bis module that is improved version of AODV. To enhance AODV-bios, location information is utilized during route discovery to limit forwarding Zone by e-geocasting by only a little modification of packet format. The outcome of this research is it greatly reduces the RREQ packet or it protects from reestablishing the path by RREQ. HONG-PENG WANG et-all [12] proposed Enhanced AODV protocol that is the enhance version of AODV in which mobile nodes aware of the local connectivity to its neighbor in the network it achieved by the extension of the hello message but with the lower overhead. It also prevents unidirectional link in the network to some extents. The outcome of this research is to reduce route load in the network. Khushboo Agarwal et-all [13] introduced EAODV, is the next generation of AODV which offer quick adaptation to dynamic link condition, low processing overhead and low network utilization. EAODV reduces hop count, latency time and enhance throughput, packet delivery ratio in MANET. It also maintains multiple routes towards the destination and also the shortest route. Sandeep Suman et-all [14] proposed E-AODV is the extensions of AODV in which two concepts are merging Blocking Expanding Ring Search (BERS) & routing packets as HELLOW packet techniques for the reduction of routing overhead. The outcome of this research is that E-AODV performs better than AODV.

3. CONCLUSION AND FUTURE RESEARCH DIRECTION

In this paper we have done surveys of all the paper published in AODV. In future we would like to improve this protocol by removing one of the drawbacks of AODV that is routing overhead by our proposed methodology and research work. As described in this paper, significant research has already

been performed in the area of congestion and security. However a number of issues still remain unresolved or not completely addressed.

To provide QoS up to satisfactory level when the number of nodes increases in the network it usually decreases, Signal strength decreases due to increases of routing overhead in the network, to resolve the problem of energy or distribution of energy properly still an open question, and protection from various kinds of routing attack in the network.

Addition all the proposed solution is in most cases not tested in a real environment Therefore, future studies should rather be devoted to real implementation than just a simulation. Only such an approach can ultimately verify a protocol's usefulness in future Ad-hoc network.

Finally, it should be kept in mind that is the trade-off between signal strength, routing overhead, congestion, security and Quality of services etc. It is challenging issues to resolve all problems together. However the list is still open due to continuous emerging new technology in Ad-hoc Network.

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