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Comparative Study of Various Reactive MANET Protocols

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Abstract:- Wireless ad hoc network acquired attention of research, as it does not require any infrastructure for its connectivity. So, it works independently with certain number of mobile nodes. The nodes used in the ad hoc are autonomous nodes which work as both the host and the route. The flexibility of nodes affects both the source and destination.

Adaptive routing protocol establish specifically for the use of ad hoc environment that have at least one receiver .In this paper for the experimental purpose, Researcher studies about the adaptive routing protocol of the ad hoc network and compare its two protocol AODV which is a single path, loop free protocol while AOMDV uses multipath to communicate between single node and destination. Due to limited resources in MANETs the routing is vital issue.

Keywords :- Network; Adhoc; AODV; AOMDV; MANETs.

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I. INTRODUCTION

Mobile Ad Hoc Network is a wireless network is extensively useful in various application as well as defense purposes, it has self configuring quality and is infrastructure less which differ the MANET from the router and even other network. As it has an autonomous nodes so the nodes acts as both the router and the host, in router the nodes moves only through the particular path whereas it is not similar in the MANET. [1]

As the mobile ad hoc network is infrastructure less the nodes are free to move anywhere and can attached to any other device and even it can attach to a large network   if required or may be operate by them only
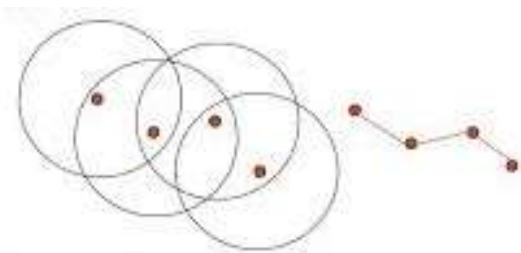

Fig:-1 Hop by hop communicating

II. ROUTING PROTOCOLS

There are various routing protocols being use in the ad hoc network for the data transmission such as the reactive protocol, proactive or the adaptive protocol and even the hybrid protocol but adaptive routing protocol is considered as one of the best routing protocol. [1]

Adaptive routing establish specifically for the use of ad hoc environment that have at least one receiver .The route is established from the source to destination for which it does not have the route information, it starts the route discovery process which goes from nodes to nodes until it reaches to the destination, the on demand protocol is efficient when the route discovery is more than the data transfer because the network traffic caused by the route discovery is low in comparison to the total bandwidth. [1]

➢ Proactive routing protocol-this protocol uses the table driven approach. It maintain a updated list of the destination
  Ex –OLSR, DSDV, WRP
➢ Reactive protocol-create and maintain the route when required else the unrequited path removed
  Ex-AOD, AOMDV, DSA, TORA

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➢ Hybrid protocol- use both the protocols, as it starts with proactive and then uses the reactive protocol in middle Ex- ZRP .

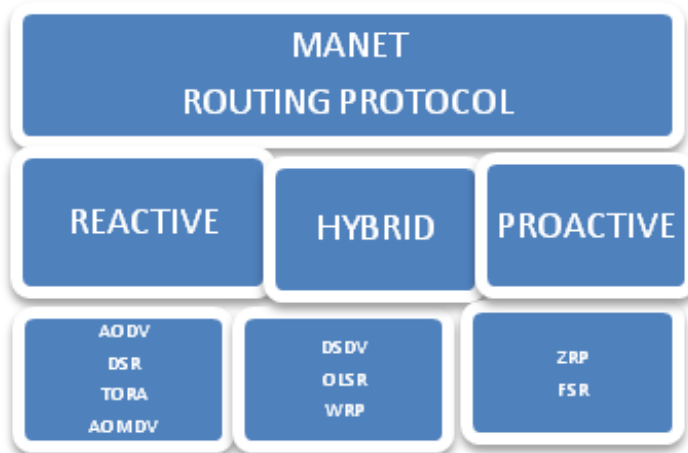The different protocols are shown in the following figure

Fig:-2 Routing protocols

III. ADAPTIVE ROUTING PROTOCOL

AODV-ad hoc on demand vector routing. It uses some characteristics of proactive routing protocols. Routes are established on-demand, as they are needed. However, once established a route is maintained as long as it is needed. Reactive (or on-demand) routing protocols find a path between the source and the destination only when the path is needed (i.e., if there are data to be exchanged between the source and the destination). An advantage of this approach is that the routing overhead is greatly reduced.

➢ Route discovery by AODV protocol [2]
  • Source node broadcast route request packets
  • Each intermediate node gets RREQ
  • Nodes establish a reserve link to the node request for the link or it broadcast the RREQ
  • After the request link reach the destination RREP is send back to the reserved link
  • Within certain time if the reply is not received by the node, again rebroadcast the RREQ or assume that no route to destination is left.
  ➢ Route maintenance in AODV protocol [3]
  • If the link is broken between the nodes the current node which found the error in the link, sends message to the source node
  • The source node, search for another route, if the older link is not found then the source node send RREQ again.
  ➢ AMODV-Ad-hoc On-demand Multipath Distance Vector Routing (AOMDV) protocol is an extension to the AODV protocol for computing multiple loop-

free and link disjoint paths. The routing entries for each destination contain a list of the next-hop along with the corresponding hop counts. All the next hops have the same sequence number. For each destination, a node maintains the advertised hop count, which is defined as the maximum hop count for all the paths, which is used for sending route advertisements of the destination.

➢ Route Discovery in AOMDV protocol[4]

  • The AODV node may receive several copies of RREQ to form reserve path but in the case of AOMDV duplicate copies can be use in the form alternate reserve path
  • AMODV uses path which have loop freedom and disjoint among them and also previous set of path to the source
  • Intermediate node checks for the path and uses RREP to source to destination path.
  • The intermediate node does not propagate the RREQ further. Otherwise, node re broadcast the RREQ to all destination
  • Route maintenance in AOMDV protocol
  • AOMDV protocol maintain the route by RREP
  • It forward the RREP to the destination when the last path to the destination breaks
  • AOMDV also included an optimization to salvage packet forward over failed link by re forwarding then by alternate path, this is similar to the packet salvaging mechanism in DSR protocol.

The protocols has basically 3 main functions [6] that is the root creation, route maintenance and route erasure. During the route creation and maintenance phases, nodes uses a "height" metric to establish a direct a cycle graph rooted to destination. Timing is an important factor for the protocols because the metric is dependent on the logical time of a link failure and it assumes that all nodes have synchronized clock.[5]. The protocols only react when all the routes to the destination are lost

IV. SIMULATION RESULT

After amazing we perform the simulation and following results were generated in respect to comparative study of AODV and AOMDV with the parameters of Packet Delivery in higher number of node in a network and lower number of node in a network. We have also given result in respect of Energy Consumed in higher and lower number of nodes.

TABLE 1.COMPARISION OF PACKET DELIVERY AND ENERGY CONSUMED

Protocols	Packet delivery		Energy consumed	
	Higher No. Of Node network	Lower No. Of node network	Higher No. Of Node network	Lower No. Of node network
AODV [7]	Low	High	High	low
AOMDV [8]	Low	High	Very high	low

TABLE 2 COMPARISON OF THROUGHPUT AND DELAY

	Throughput		Delay	
Protocols	Higher No. Of Node network	Lower No. Of node network	Higher No. Of Node Network	Lower No. Of node network
AODV [7]	Very low	High	High	low
AOMDV [8]	Low	High	Low	low

V. CONCLUSION & RESULT

Ad hoc on demand routing protocol with multipath capability can effectively deal with mobility include route failures. Here multipath protocol called AOMDV that extent the single path AODV protocol to compute multiple path is being compared by different aspect of ad hoc network we found that security issue is more effectively over covered in the AOMDV but the Energy Consumption is very high and delay is low in AOMDV in comparison with AODV.

REFERENCES

[1] V.kanakris, d.azzi "Ad hoc Energy consumption" Journal of Engineering Science and Technology Review, 2010

[2] C.perkins "Ad hoc on demand distance vector (AODV) routing" PublisherRFC Editor , United States, 2003

[3] Amitabh Mishra Virginia "Wireless ad hoc networks"Polytechnic Institute and State University, Blacksburg, 2003

[4] IAN D. Chakeres, Luke Klein Berndt "AODVjr, AODV Simplified", National Institute of Standards and Technology, Mobile Computing and Communications Review 2002

[5] Yih-chunhu, David b.Johnson , "caching in on demand routing protocol for wireless Ad hoc network"

[6] Suman Deswal and Sukhbir Singh "Routing security Aspects In AODV", International Journal of Computer Theory and Engineering, 2010

[7] Kunal Gaurav Shivpratap Pandey Piyush Sharma" A Survey to MANET Techniques Research and Related Challenges" International Journal of Computer Applications, 2014

[8] Preformance analysis of protocols of ad hoc network, Gunjeshkant singh, harminder Singh, International Journal of Engineering Research & Technology, 2014