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A Review of Performances Metrics of DSR, AODV and AOMDV Reactive Routing Protocol

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Abstract- Mobile ad hoc networks (MANET) are wireless networks that can be shapedshort of the current infrastructure where any node can act as a router.On a mobile network ad hoc networks communicate using multichannel wireless connectivity. The routing protocol theatresaimportant role in discovery and keeping the route in MANETs. Routing protocol can be a uni-path and multi-path. A multifunctional routing protocol has been developed to improve reliability in Manet. The routing protocol must be able to maintain a high level of node mobility, which frequently changes the network dynamics of the system significantly and unpredictably.A variety of routing protocols have been used. In this paper, we compare three kinds of reactive routing protocols- Dynamic Source Routing (DSR), AODV routing , which is uni-path and Multi-lane Distance Protocol (AOMDV). In this paper, we message that when relating DSR, AODV, and AOMDV, AOMDV has slower travel and packet times than AODV, but is more effective in terms of packet drops and distribution rates.

Index Terms- Ad-hoc networks, AODV, AOMDV, DSR, Routing protocols, Simulation

I . INTRODUCTION

MANET is a collection of wireless sharing nodes without central management. They do not have a fixed router that has all the nodes that are capable of arbitrary motion and dynamics. These nodes can performance as end structures and routers. When they act as a router, they find and keep the path to other nodeson the web.
areas of mobile advertising networks include instant search and remote data search.Mobile broadband networks (MANETs) are a type of broadcasting network that means gathering nodes, sharing wireless networks without centralized management. They do not have a fixed router with all nodes that are capable of moving and arbitrary dynamics. These hubs can go about as end frameworks and switches. At the point when they go about as a switch, they discover and keep up the way to different hubsOn the web. The tokens of impromptu systems depend on the transmission intensity of hubs and the area of portable hubs that can change every now and then[1].
The characteristic areas of mobile ad-hoc systemclaims include battlefield,emergency,hunt rescue and data acquisition in distant areas. Protocols are used to provide connections to other nodes and are also responsible for communication. Adhoc networks have two major problems: connectivity, failure, and node mobility[2].
Routing protocols are separated into three groups, namely proactive routing protocol, on-demand routing protocol and hybrid protocol. Several studies of performance judgements[3], [4] show that on-demand protocols achieve lower overhead costs than proactive

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protocols.Proactive protocols support routing information on available routes on the network, even if those routes are not presently in use. The main motivation behind the design of on-demand protocols is the reduction of the load route. High load on the route usually has a significant impact on the performance of low bandwidth wireless connections.
MANET main challenge is to move at a lower cost, even if the situation is dynamic.Here the above is distinct in terms of transmission, protocol management, which uses both the frequency band and the battery life of the node increased [5]

Table1 : Different Routing Protocol Comparative table

Protocols	Architecture	Operation	Forwarding	GPS
AODV	Ad hoc	Based on topology	*Unicast*	No
AOMDV	Ad hoc	Based on topology	*Unicast*	No
UMB	Infrastructured	Dissemination	*Broadcast*	Yes
MaxProb	Ad hoc	Based on topology	*Unicast*	No
GPSR	Hybrid	Geographic	*Unicast*	Yes
ANTNET	Ad hoc	Based on topology	*Unicast*	No
ARA	Ad hoc	Based on topology	*Unicast*	No
POSANT	Hybrid	Geographic	*Unicast*	Yes
P-AODV	Ad hoc	Based on topology	*Unicast*	No
P-AOMDV	Ad hoc	Based on topology	*Unicast*	No

communication/processing. Many lanes can be made up of both traffic sources and midway nodes, with new lanes being opened only as needed, reducing road delays and excess traffic. In our document, we focus on the following routing protocols: DSR, AODV, and AOMDV.

III.ROUTING PROTOCOLS

Route referrals are known as custom routing protocols These protocols contain no network information if there is no communication. These protocols use a lazy way of routing . They do not regularly maintain or update their travel charts with the latest religious topics. If a node wants to send packets to another node, this protocol finds a path and creates a connection to send and obtain packets. Custom protocol types are used. In this paper, we discuss the Dynamic Source Transmission (ADR), the On-Demand Specific Vector Protocol (AODV) and the Multi-Path Orientation Protocol (AOMDV)[6].

A. Dynamic Source Routing (DSR)

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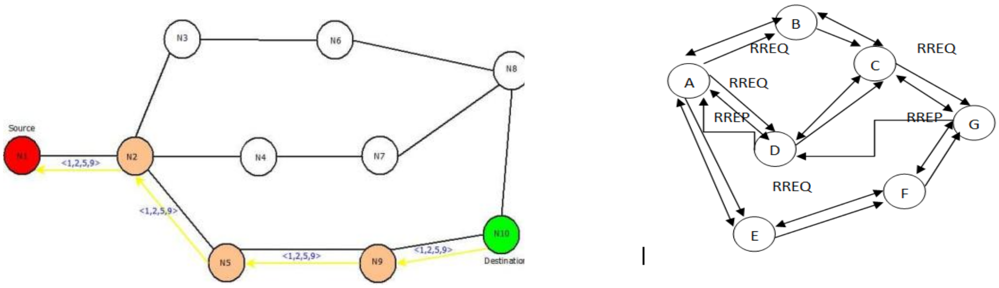

Fig 1:-Dynamic Source Routing[7]

DSR does not use periodic monitoring messages such as AODV. As a result, bandwidth over a reduced mode saves battery life and avoids major road updates. However, to detect a connection not working,.The DSR directing convention utilizes fundamental components to course and store course data starting with one hub then onto the next. These are: Road Discovery - to find the path between route support and destination source - the cancellation of a route that faces the cancellation of another route is called off-road. DSR has the distinct advantage of source transmission. Because the route is partial to the packet, the loop, both short and long, cannot constitute rapid detection or retraction. In the event that lone the goal reacts to the way demand and the source hub consistently starts the solicitation, the main way might be the most limited way. This steering convention is reliable with the idea of source directing, which implies that the source decides right from the source to the goal

B. Ad-Hoc On-Demand Distance Vector Routing Protocol (AODV)[8]

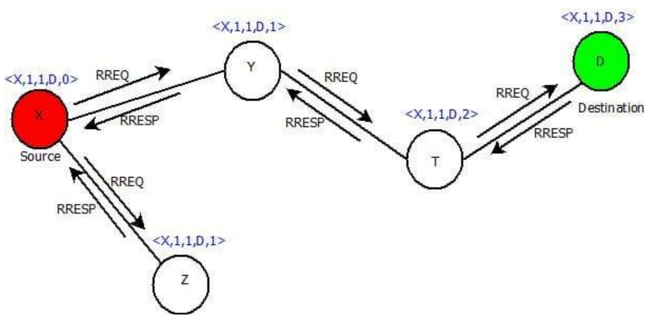

Fig 2: Routing AODV [8]

if $(seq\_num_i^d < seq\_num_j^d)$ **or** $((seq\_num_i^d = seq\_num_j^d)$ **and** $(hop\_count_i^d > hop\_count_j^d))$ **then**
  $seq\_num_i^d := seq\_num_j^d;$
  $hop\_count_i^d := hop\_count_j^d + 1;$
  $next\_hop_i^d := j;$
end if

Fig3: Route Update Algorithm

AODV is an adaptation of the algorithm to work in a mobile environment. The router AV is considered a state machine for processing incoming requirements from network entities. AODV sets the path to the end point unless the request node sends packets and the source supports those paths as long as needed. There are Sequence numbers to ensure the freshness and circle free directing. Each time a solicitation is sent to communicate something specific from the AODV

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switch, its steering table will be checked for transmission. All elements in the routing table include the following fields When there is a path the message is sent to the bounce after the switch. Something else, a message will be sent to the message line and a way solicitation will be begun to discover the way. The four sorts of control messages are utilized in the AODV convention. The Route Request Message (RREQ) and Route Response (RREP) are utilized to discover the way. Street blunder message (RERR) and HELLO message are utilized to fix the way

C. Ad-Hoc on-Demand Multipath Distance Vector(AOMDV)[9]

A key feature of AOMDV over AODV is that it provides multiple routes to the destination. These paths are not cyclical and do not interact with each other. It calculates the alternate path between the source pair and the target pair with the minimum upper bound on the AODV. It is originated on the distance vector and the hops via the hopping method.

. In AOMDV, the distribution of origin to the RREQ-generating destination creates multiple return paths, both at the intermediate node and at the destination. Multiple path responses cross these return paths to create multiple paths toward the source and intermediate nodes. AOMDV also provides middle nodes with other routes, as it shows that it is useful in reducing the frequency of route detection. It checks all copies, and only retains those copies, which preserve the freedom of contouring and segregation. The AOMDV route update rules apply to each node to provide freedom and disconnect.

It is based on distance vectors and hops by the jump method. There are also two basic AODV features: 1) route detection, 2) route support.

destination	sequence number	hop count	next hop	timeout

(a) AODV

destination	sequence number	advertised hop count	route list			
			$next\_hop_1$	$last\_hop1$	hop_count_1	$timeout_1$
			$next\_hop_2$	$last\_hop2$	hop_count_2	$timeout_2$
			.	.	.	.
			.	.	.	.

(b) AOMDV

For Discovery Road, pack the RREQ online and wait for RREP. In AOMDV, the distribution of origin to the RREQ-generating destination creates multiple return paths both at the middle node and at the destination. Multi-way reactions converge these arrival ways to make different ways to the source and transitional hubs. AOMDV additionally furnishes halfway hubs with substitute ways, as they show that they are helpful for decreasing the recurrence of course discovery. It inspects all copies and only stores those copies which preserve freedom, contour, and separation. The rules for updating the AOMDV path are applied to each node to provide freedom and disruption. Creating RREP needs a number of "lax" approaches. It makes RREP in answer to each RREQ package RREQs.

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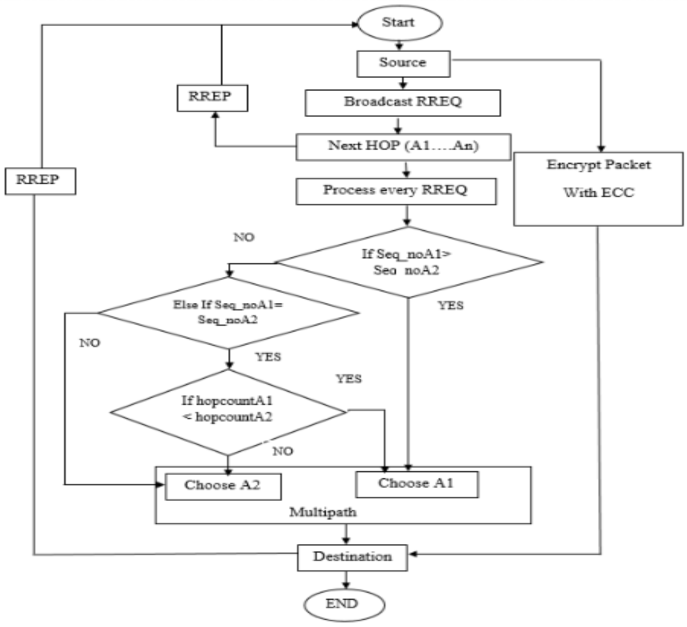

if $(seq\_num_i^d < seq\_num_j^d)$ **then** {/* enforces the sequence number rule */}
  $seq\_num_i^d := seq\_num_j^d$;
  $advertised\_hop\_count_i^d := \infty$;
  $route\_list_i^d := NULL$;
  if $(j = d)$ **then** {/* neighbor is the destination */}
    insert $(j, i, 1)$ into $route\_list_i^d$;
  else
    insert $(j, last\_hop_{jk}^d, advertised\_hop\_count_j^d + 1)$ into $route\_list_i^d$;
  end if
else if $((seq\_num_i^d = seq\_num_j^d)$ **and** $(advertised\_hop\_count_i^d > advertised\_hop\_count_j^d))$ **then** {/* enforces the route acceptance rule */}
  if $(j = d)$ **then** {/* neighbor is the destination */}
    if $((\nexists k_1 : (next\_hop_{ik_1}^d = j))$ **and** $(\nexists k_2 : (last\_hop_{ik_2}^d = i)))$ **then** {/* establishes uniqueness of next and last hops */}
      insert $(j, i, 1)$ into $route\_list_i^d$;
    end if
  else if $((\nexists k_3 : (next\_hop_{ik_3}^d = j))$ **and** $(\nexists k_4 : (last\_hop_{ik_4}^d = last\_hop_{jk}^d))$ **then** {/* establishes uniqueness of next and last hops */}
    insert $(j, last\_hop_{jk}^d, advertised\_hop\_count_j^d + 1)$ into $route\_list_i^d$;
  end if
end if

Fig 4: AOMDV Flowchart and Algorithm

AOMDV has three new featuresassociated to other custom routing protocols. First of all, it does not have a first-order switch, RREPs follow a return path, dispersed by nodes, and thus disconnected. The trajectory of coordination from above, like some other protocols. Second, it provides the separation of alternative paths through a distribution calculation without using the source path. Third, AOMDV computes elective courses with insignificantadditional expenses on AODV. It does this by using the routing info as much as possible.

II. LITERATURE REVIEW

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Author	Technical information	Parameters
N. SreeDivya, Veeramallu. (2019)	Adhoc Networks (VANET) considering certain features. VANET's are powerful in dealing with changing environmental conditions and high movability of vehicle hence protocols depending on position or geographic routing protocols	Considering the various design protocols, future improvements are made based on the advantages and disadvantages of the geo-based protocol. Protocols include geographical and geographic transmission techniques
Joilson Alves Junior Emili G. Will (2018)	Many routing protocols that can be used in Vannet. Therefore, the main purpose of this work is to classify, discuss and compare protocols by reviewing research in this area.	The routing protocol is motivated by the behavior of the subject in the forest and is designed to operate in distributed mode, using mobile agents to search for specific routes.
JubairM.et al.(2016)[10]	AODV PresentationJudgement, AODVM. When there is an increase in simulation time, AODV has a better PDF than AOMDV. The AODV routing protocol has a better end-to-end delay than the AOMDV routing protocol.	Eto E Packet Delivery Routing overhead.Ratio,Delay, Throughput,
AliwaM. et al. (2015)	The DSDV, AODV, and DSR.DSR analyzed were significantly lower than in normal road load in all sources	Normalized Routingload
Patil G. et al. (2016)	Assessment of AODV and DSR performance. The results show that the DSR routing protocol performed better in the CBR, Pareto, and exponential traffic models in terms of transmission and delay loading. If the MANET program is "cross", the AODV routing protocol is slightly better in all three DSR traffic patterns.	CBR, Pareto and exponential traffic models using the Waypoint random mobility model for scalable networks to skip routing and delay to endpoints.
Garg M.et al.(2014)	Compare AODV and DSR performance. The number of jumps per route is smaller in the case of AODV compared to the ABS, indicating that it is less prone to congestion on the network. The number of error messages is huge in the case of AODV.	Numberof RREQ Packets Forwarded, RREP Packets Received NumberofHop Counts,
Bokade M. et al. (2014)	Random-point randomization model The Manhattan Group The Benson Group used to compare the SDDA and ACS. The DSR's	End-to- End Delayand Normalized Routing Overhead Packet Delivery Ratio

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	performance is better than that of AODV and DSDV.	
Raja L.et al. (2014)	The DSR, AODV and TORA implementations were compared. AODV and DSR use less power than TORA. EOD has the best performance of all circles. DSR is suitable for medium mobility networks	Packet Delivery, Overhead
Natarajan K. et al.(2013)	The performance of the MANET DSR, AODV, DSDV and TORA routing protocols was evaluated. The AODV protocol showed better act than the additional protocols. TORA has the nastiest performance, and the DSDV has a continuous behaviour in each scenario due to its organization scheduling.	Packet Delivery Ratio, Routing Overhead.
Bhadauria H.S. et al. (2013)	Conducted an analysis of the effectiveness of online AODV protocols of different sizes. Simulation results indicate that AODV is effective	LAN load, Throughput, Total traffic received
Rajkumar G. et al.(2012)[11]	Analyze performance comparisons of DSR and AODV routing rules. With a high network load, AODV can grip and transmit information packets more professionally than AESV. With less network storage, DSR cannot outperform its AODV counterparts.	Packets Drop and Throughput, End-to-End Delay
Adam et al.(2010)	The performance of the DSR, AODV, and TORA routing protocols is evaluated when the density of nodes or the number of nodes varies. DSR has a lower routing charge than AODV, which has less than 50 nodes. The increase is rapid for AODV and DSR with cumulative amount of nodes.	Packet Delivery Ratio, End-to-End Delay, Packet Dropped, Routing loadand Throughput
HumairaN. et al.(2011)	AODV and R-AODV. The results showed that the R-AODV protocol had better performance and a longer average delay with node acceleration.	End-to-End delay, Throughput.

IV.COMPARISON OFDSR , AODV and AOMDV

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Comparison of three reactive routing protocol is done on the basis of performance metrics such as throughput, Routing overhead PDR, end to end delay etc.

Table 2 Comparison between DSR , AODV and AOMDV

S.N	Performance metrics	DSR (unipath)	AODV (unipath)	AOMDV (multipath)
1	Throughput	Good at moderate traffic load	Good at high traffic load	Better than AODV
2	Packets dropped	Higher than AOMDV	Higher than AOMDV	Low
3	Packet delivery ratio	Good	Good	Better than DSR and AODV
4	Routing overhead	Less at moderate traffic load	Low at high traffic load but Higher than AOMDV	Low
5	End to End delay	High	Lower than DSR but Higher than AOMDV	Low
6	Optimal path length	High	High	Low

VI.CONCLUSION

Comparative analysis of different routing protocols was performed. The emulation protocols are AODV and AOMDV. From the results, the authors write that the proportion of AOMDV packets is low compared to AODV in high-density traffic scenarios. But it suffers from normal travel conditions from

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above. This study concluded that AOMDV is more suitable for high-speed data applications with greater reliability.

Specifically, we offer multiple switches on a well-researched single-protocol protocol known as DSR and AODV. Comparison of the performance of AOMDV with AODV and DSR using simulations shows that AOMDV can effectively deal with the by mobility. In particular, it reduces packet loss and receives significant end-to-end delay improvements. AOMDV reduces routing by dropping the incidence routing detection processes.

In AOMDV, the distribution of origin to the RREQ-generating destination creates multiple return paths both at the intermediate node and at the terminus. Many RREPs intersect these reappearance paths to form multiple pathways to middle sources and nodes.. The core of the AOMDV protocol is to ensure that many open roads are not dry and disturbed, as well as locate effective routes through flood monitoring. Routing represent the only extra cost in AOMDV over AODV. AOMDV was analyzed as the best protocol compared to other protocols.

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