Performance of HLAR protocol for Position Detection Change with Different Speed in VANET

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Abstract— VANET is a highly mobile wireless technology which is implemented to helping traffic monitoring, safety of vehicles, and other type of applications. It uses moving vehicles acts as a node that is to create mobile network. Accuracy of vehicles position can be estimated by on board sensors or Global positioning system. It is used for short range and high speed communications among vehicles and roadside infrastructures. Within this network there are huge amount of vehicles on highway and city streets that leads to several attack and overhead that the robust privacy protection must be needed. It has capabilities to solve malicious attacks, by use of hybrid locations based ad-hoc routing (HLAR) it affects that overhead is also reduced.

Key words: VANET, HLAR, AODV, DSR, GPS

I. INTRODUCTION

Vehicular Ad-hoc Networks (VANETs) is advance technology used to improvement in human driving, maintaining traffic flow control system. Position information based technique is most effective technique for VANET to achieve security and authentication, according to authentication it provide safety and to avoid malicious attack. Vehicle received so many information becomes big problem because it is difficult to verify data within short range that is the way in present Days VANET use tracking technique using GPS but GPS does not track not hills.

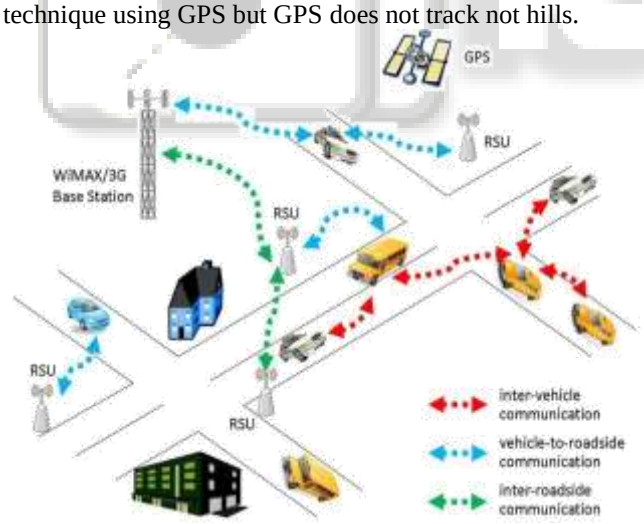

Fig 1: Vehicular Communication

II. ROUTING PROTOCOLS FOR VANET

A. Ad-hoc on Demand Vector (AODV)

AODV is reactive Routing protocol that based on distance vector algorithm. AODV routing protocol with large number of mobile nodes .AODV is an improved protocol on DSDV and DSR, as it minimizes the number of broadcasts by creating On-Demand basis routes[10] and on DSR route request which is based on incrementing time-to-live (TTL) which prevent RREQ flooding[11] . AODV is a reactive Routing Protocol that maintains the Routing information along the active path [7]. Node are used with network to performs the process of forwarding packets include route request (RREQ) it sends request to intermediate nodes .Nodes within the active route keeps the record to reply AODV.

In Ad-hoc on demand distance vector ,where source node communicate with a destination node but no routing information provided ,so it initiates route discovery process .The broadcast node route request packet to its neighbors .It consist of sequence number ,source address, broadcast ID, destination sequence and hop count and address number. The broadcast ID and source address define a (Route Request) RREQ. The source sequence number is used for maintaining information freshness to the reverse route to the source .When it can be accepted through the source then the destination sequence number identify how fresh a route to the destination must be .when a neighbor knows the route about destination ,then it replies control message of route RREP that it propagates by using reserve path .Then otherwise ,neighbor will re-broadcast the RREQ until act the maximum number of hops is reached and active route is found.

The Advantage of the AODV is to reduce traffic control message overhead at increased latency for finding new routes.

B. Dynamic Source Routing Protocol (DSR)

It is reactive routing protocol designed for use in multi hop wireless network. It is on demand protocol that uses source routing where all routing information is maintained .It has two phases that is Route discovery and Route maintenance.

In DSR, whenever source node has send packet to destination for checking route is cache by node during route discovery .If it does not find any route address of packet and packet forward to its neighbors . To, accomplish route discovery, then it will receive route reply packet .Network hope may be reached through target node. Route reply is generated when message has reached to either destination or intermediate node.

C. Hybrid Location Aided Routing (HLAR)

The new hybrid location based protocol that combine modified AODV protocol with greedy forwarding geographical routing protocol .It is used to find best quality route

HLAR routing protocol ,where source node has no route to destination so source node include location coordinate of both itself and destination in RREQ packet. So choose closer neighbor vehicle is present. RREQ packet is forwarded if it has no closer neighbor, Then procedure is repeated until RREQ packet is reached to destination. RREQ packet include TTL is decremented each time when vehicle cannot find location information. When TTL becomes zero

if RREQ packet will be dropped so it allow to avoid unnecessary flooding in whole network.

III. SIMULATIONS

Parameter	Value
Simulator	MATLAB
Simulator area	1000m x 1000m
Routing Protocol	AODV,DSR,HLAR
Transmission range	250m
Mobility	Random way point
Pause time	20 s
Bandwidth	2 Mbps
Packet rate	4 packets/sec
No. of Nodes	10,20,30,40,50,100
Node speed	10,20 m/s

Table 1: Simulations

IV. RESULTS AND DISCUSSION

A. Packet Delivery Ratio (PDR)

Packet delivery ratio (PDR) is the ratio of total packets received by the destinations to total packet send by the sources.

PDR=(Total packet received)/(total packet sent)

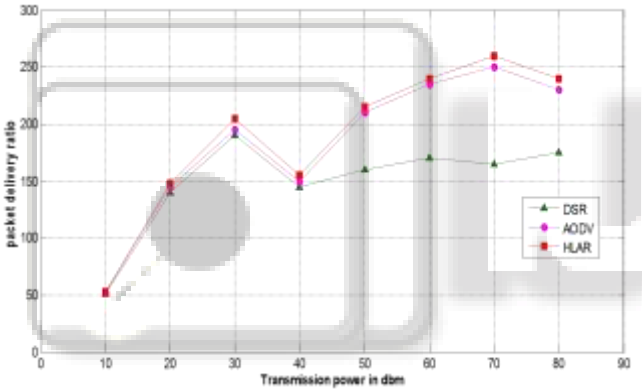

Fig. 2: PDR

B. Packet Loss:

It is defined as "The total number of dropped packets during simulation process."

Packet Loss= Number of Packet Send – Number of Packet Received

If packet loss is low that means better performance of routing protocol

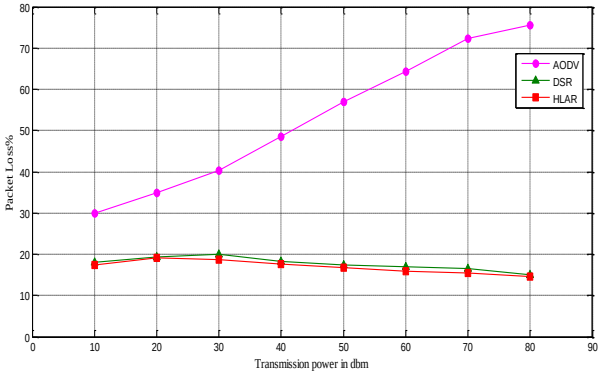

Fig. 3: Packet Loss

C. End To End Delay:

It is defined as "the average time taken by data packet to receive at destination. It includes delay caused by route discovery process and queue in data transmission packet. The data packet successful deliver to destination only that counted.

End to End Delay= (Arrive Time –Send Time) /Number of Connection

If value of end to end delay is low means better performance of protocol.

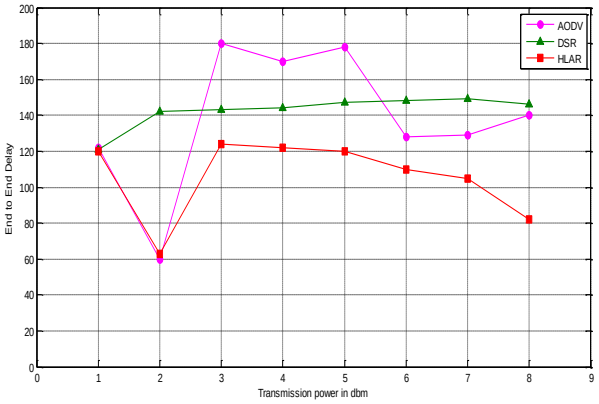

Fig. 4: End to End Delay

V. METHODOLOGY

- First of all, simulation environment is to be set then MATLAB software is used to perform and obtained results.
- Comparison of performance of routing protocol is made with different speed and transmission power.
- Results obtained under some types of parameters such as packet delivery ratio, , packet loss, and end to end delay.

It is used to evaluate the performance of AODV, DSR and HLAR for VANET .The performance analysis of these different routing protocols .It can be evaluated with the help of MATLAB simulator.

VI. CONCLUSION

The work is a better work for society to avoid accidents..In this paper, we used performance to evaluate AODV, DSR, and HLAR routing protocols for vehicular ad hoc networks .The position based routing protocol (HLAR) Hybrid protocol and topology based AODV and DSR for vehicle to vehicle communication. For this performance HLAR is better for VANET.

So, it will be concluded HLAR provide better performance in terms of packet delivery ratio, for both management of traffic of vehicle. FUTURE SCOPE is to ensuring road safety and providing vehicles with extended information about current network vehicles using coded repetition technique.

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