Comparison of AODV and DSR routing Protocols by using mobility model in Vehicular Ad-Hoc Network

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ABSTRACT

Vehicular ad hoc network is a type of network and provides the communications between vehicle to road side, vehicle to vehicle and vehicle to infrastructure. VANET has new applications and features for travelers to providing vehicle related information for safety purpose that have never been possible in past. It is a application of MANET. In MANET the node is communicating with the base station. The present paper is mainly intended to compare the routing protocol for the improvement of network services by comparing the routing protocol in terms of throughput, end to end delay and jitter using Qualnet 6.1. The research works evaluate the performance of two protocols namely AODV and DSR.

Keywords
VANET, MANET, AODV, DSR, QUALNET

1.INTRODUCTION

A special type of wireless ad hoc network is known as vehicular ad hoc network. It is obtained between vehicle to vehicle for exchanging the vehicle information directly but if vehicles are in a range else sending the message information and vehicle location through multi hop fashion.

In some error found of signal that vehicle fall away range and drop out the network, in that case mobile internet is created and remaining vehicle join the connecting vehicles to one another.

The application of VANET is road safety, e-commerce and many more. VANET has property to exchange information using vehicle as a node. A unique class of MANET is known as VANET [1].

All these nodes of VANETs are using cars, buses, and motor cycles for communication purpose with the base station. For the road course and traffic regulations the movement of the VANETs nodes will be restricted by the factors and by some means of fixed infrastructure in the network regularly access for stationary networks could be achieved.

It is noted that the VANET must be rely fast on one node to other node and node to node communications [2].
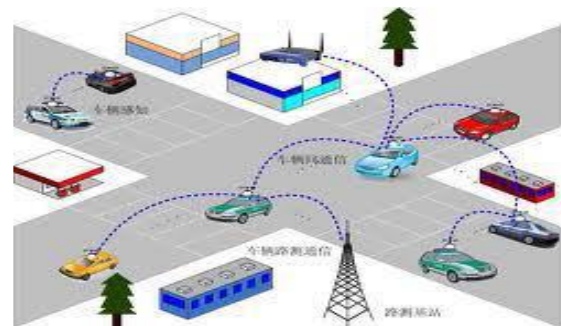

Figure1: Architecture of VANET

2. VANET PROTOCOLS

2.1 AODV

Ad hoc demand distance vector routing protocol is a reactive protocol. This reactive routing protocol has a table. The routing table of reactive protocol do not update every time it is only updated when a node receives the control packet that time this routing table is updated.

This routing protocol is same as MANET routing protocol and is developed for mobile networks. AODV has several properties that it is loop free and capable of handling both unicast and multicast routing and also working only on demand [3].

2.2 DSR

DSR is also reactive protocol. The DSR assembly will oblige each one bundle to pass on the whole area from source to goal. This protocol has property that it is capable only for the use of multi hop networks and is useful for nodes.

If there is large network then this protocol will not be very efficient. In dynamic source routing protocol every packet carry the complete address of source to destination [5].

For mobile IP it is interoperated and have migrated between WLAN'S, and other communication data services. There is no existence of network administration because network is completely belonging to self configuring so there is no existence of network infrastructure. DSR discover a source route across multiple networks to destination VANET.

3. SIMULATION SETUP AND PERFORMANCE METRICS

To evaluated the comparison of routing protocols after the simulation using the Qualnet 6.1. Nodes are travelling with speeds over 1000*1000 meters area for 150sec simulation time and it follows a mobility model of random way point.

It uses a same scenario because these routing protocols have unique property to produce output. And the all the parameter of the simulation is shown in table 3.1.

Table 3.1. Simulation parameters [7]

Parameter	Value
Simulation area	1000*1000
Simulation time	150sec
Simulator	QUALNET 6.1
Number of nodes	100
Routing protocols	AODV,DSR
Data types	CBR
Packet generation rate	80 kbps
Packet size	512 bytes
Mac protocol	IEEE 802.11e
RTS/CTS	None
Channel type	Wireless channel
Mobility model	Random way point
Antenna type	Omni antenna
Network	Ipv6
Pause time	2.0s

4. SIMULATION RESULTS
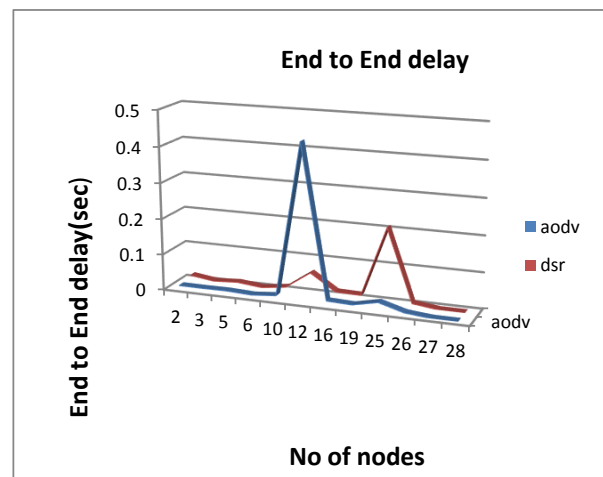
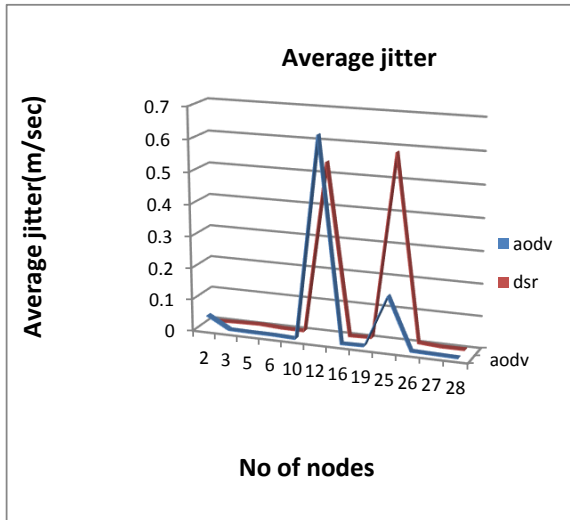

Figure 2. End to End delay Vs no. of Nodes

Routing Protocol	Node	Throughput	Average End to End Delay	Average Jitter
	node 25			
DSR	at node 25	High	High	High

Figure 3. Jitter Vs no. of Nodes

From the simulation results it is found that AODV has high jitter then DSR routing protocol. Also AODV has highest throughput then DSR. finally the last comparison i.e. end to end delay AODV is show high performance then DSR.

at last AODV proves to be more promising and versatile then the other protocols. In both three cases results is that AODV is better than DSR. Here the performance of AODV is best because of the routing protocol of AODV is reactive in nature.

5. CONCLUSION

The present paper shows the comparison of AODV and DSR. From the simulation it is cleared that AODV has a good performance then DSR. In VANET, application AODV is well suited then other protocols for vehicular ad hoc networks.
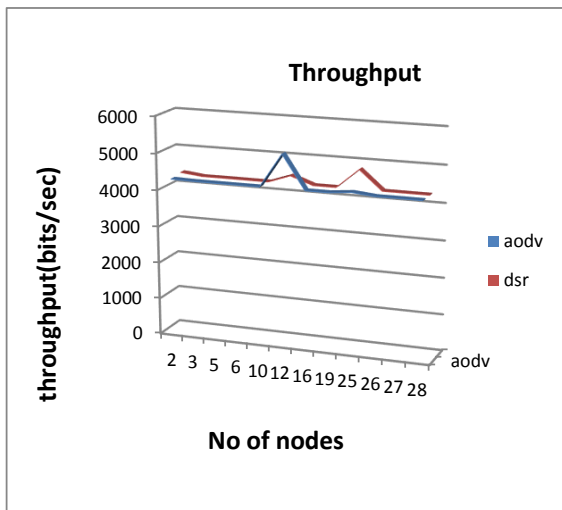

Figure 4. Throughput Vs no. of Nodes

Table 4.1 Tabular Comparison of AODV & DSR

Routing Protocol	Node	Throughput	Average End to End Delay	Average Jitter
AODV	At node 12	High	High	High
DSR	At node 12	Low	Low	Low
AODV	At	Low	Low	Low