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Simulation and Performance on Demand in Routing Protocol in VANET

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Abstract: ***The most distinguishing advantage of VANETs is that this technique can perform an efficient communication without fixed infrastructure and can survive rapid changes in the network topology.. This paper performs a kind of comparative survey on applying AODV – Ad Hoc On Demand Distance Vector and DSR – Dynamic Source Routing (DSR) routing protocols with identical loads and evaluates their relative performance.***

Keywords: DSR, AODV

1. Introduction

Vehicular ad hoc network (VANET) is a specific form of MANET. This field includes vehicle to vehicle communication and vehicle to Road Side wireless communication. Vehicular Ad Hoc Network Communication is an extensive region of research in Wireless technologies. (VANET's) technically based upon the smart Transportation Systems that uses moving cars (Vehicles) as required nodes in a network to perform such an autonomous mobile network.[1] Routing in VANET can be categorized upon transmission strategies or routing information. Unicast, broadcast, multicast are various transmission strategies. Topology Based and Position Based routing protocols use a mixture of routing information, such as position based routing required preinstalled map or route information.[2]

2. Characteristics of VANET

- Highly Dynamic Topology
- Frequently Disconnected Network
- Patterned Mobility
- Propagation Model:
- Unlimited Battery Power and Storage:
- On-board Sensors

3. Routing Protocols in Vanet

3.1 Proactive protocols: (table-driven)

This type of protocols builds routing tables based on the current connectivity information of the nodes. The nodes continuously try to keep up to date routing information. Proactive- topology based Routing protocols are developed to work in low mobility environments (like MANET), such as Optimized Link State Routing (OLSR) and Destination-Sequenced Distance Vector Routing (DSDV) Ad-hoc On Demand Routing (AODV) and Associativity Based Routing (ABR) protocols.[3].

3.2 Reactive (On-Demand) Protocols:

This type of protocols relies on flooding the network with query packets to find the path to the destination nodes. The Dynamic Source Routing (DSR) is one of the reactive topology-based routing protocols. In the DSR, a node sends out a flood of query packets that are forwarded until they reach their destination. [4] this routing, upon receipt of a broadcast query, nodes record the address of the node sending the message or the previous hop and is called backward learnings

4. Routing Simulation

4.1 AODV – Ad Hoc On Demand Distance Vector

In this routing, upon receipt of a broadcast query, nodes record the address of the node sending the message or the previous hop and is called backward learning. Upon arriving at the destination, a reply packet is then sent through the complete path obtained from backward learning to the source At each step of the path, the node records its previous hop and establishes AODV is a distance vector routing protocol, when a node wants to establish new communication with another node, it searches for an available path to the destination node in its routing table .AODV is an ad hoc on demand routing protocol. That means the routes are only established when need to reduce traffic overhead. AODV supports unicast broadcast and also multicast.[10].

4.2 DSR – Dynamic Source Routing (DSR)

(DSR). On demand protocol designed to restrict the bandwidth consumed by control packets in hoc wireless network. It is beacon-less and hence doesn't require periodic hello packet transmissions which are used by a node to inform its neighbors of its presence. During the route construction phase, it establishes a route by flooding Route Request packets in the network. The destination node, on receiving a Route Request packet, responds by sending a Route Request packet back to the source. [9].

5. Simulation Results and Discussion

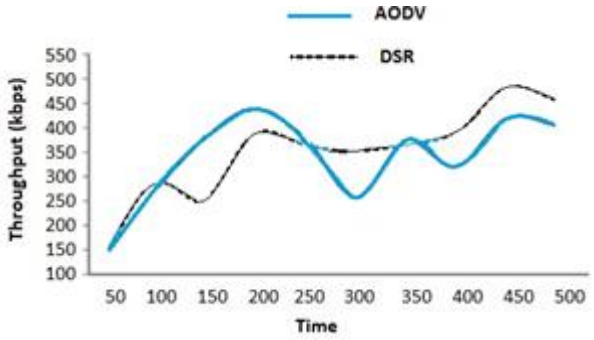

Figure 1: Throughput of AODV and DSR

Fig(1) compares between two protocols , the same models are used, the number of traffic sources is fixed at 50,the maximum speed of the nodes is set to 20m/s and the time is vary as 50, 100, 150, 200,250, 300, 350, 400, 450 and 500. It shows that there is an increasing through put in AODV in 100,150,200,250higher than DSR but in 300,350 ,400,DSR higher than AODV

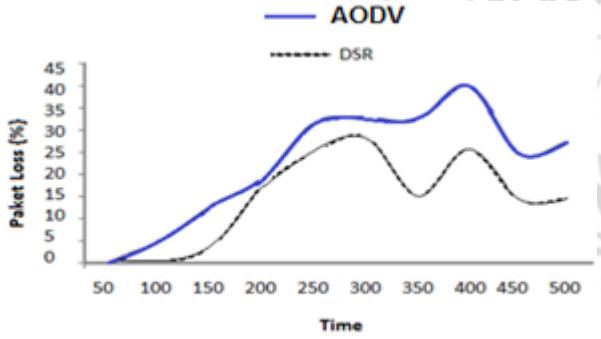

Figure 2. Packet Loss of AODV and DSR

fig(2) compares between two protocols , the same models are used, the number of traffic sources is fixed at 50,the maximum speed of the nodes is set to 20m/s and the time is vary as 50, 100, 150, 200,250, 300, 350, 400, 450 and 500. It shows that there is an increasing packet loss in AODV as compared to DSR when the time increase

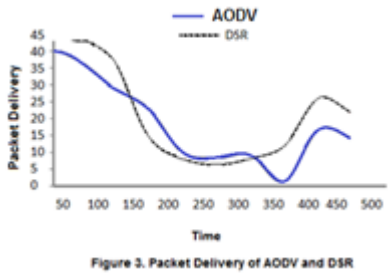

Figure 3. Packet Delivery of AODV and DSR

fig(3) compares between two protocols , the same models are used, the number of traffic sources is fixed at 50,the maximum speed of the nodes is set to 20m/s and the time is vary as 50, 100, 150, 200,250, 300, 350, 400, 450 and 500. It shows that there is an delivery packet for AODV and DSR are similar in 50, 200, 250, and300 times shown in figure 3. but, in 150, 200, 250, 300and 500 times, AODV higher than DSR by about 10 percent.

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