STUDY OF ISSUES RELATED TO IMPROVE ROUTE STABILITY AND CHANNEL AVAILABILITY IN AODV ROUTING PROTOCOL IN VANET

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ABSTRACT

Vehicular Ad Hoc Network (VANET) is a sub class of mobile ad hoc networks. VANET provides wireless communication among vehicles and vehicle to road side equipments, according to IEEE 802.11 p standard for end to end communication between vehicles . For end to end communication between vehicles a routing protocols is used to find a route based on link properties. One of the most important routing protocols used in ad hoc networks is AODV. This protocol is a connectivity based reactive protocol that searches routes only when they are needed. It always exchanges control packets between neighbor nodes for routing. In this article author present cross layer technique that find channel availability (CAV) at link layer to AODV routing protocol to improve the communication in vehicles for safety purpose. To eliminate route discovery routers, propose PAODV as routing protocol. It improves AODV control overhead and makes routes more stable.

***Keywords**: Ad hoc network, VANET, AODV, PAODV, channel availability (CAV).*

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1. INTRODUCTION

Vehicular Ad-hoc Network or VANET is the wireless network for communication among vehicles on roads without base stations on which IEEE 802.IIp and IEEE 1609 known as wireless access in vehicular environments (W AVE) are relied for between-vehicles. It divided into 2 main categories. First , the application puts emphasis on increasing safety for vehicles, which is called Safety Application. Second, the application is focused on entertainment and rendering data services for passengers, which is called User Application.[1] As a special example of Mobile Ad hoc Networks (MANET), Vehicular Ad hoc Networks (VANET) not only has general characteristics of MANET, but also has many special aspects[2]. Ad hoc Networks is a wireless communication network which comprises a set of mobile nodes with wireless transcribing equipments. It does not rely on pre infrastructure to form temporary networks in which mobile nodes make use of their own transcribing equipments to exchange information so that nodes in networks can share information. When the mutual communication is not in the scope of their own, it can make use of other intermediate nodes to achieve the multi-hop communication. [3]AODV routing consists of three phases: route discovery, data transmission and route maintenance. Route discovery phase starts when a node wants to transmit data and has no route to destination. Now, AODV call route discovery process. In this phase, source node broadcasts a Route Request Packet (RREQ) to its neighbor. Nodes that receive RREQ packets divide into three categories: the receiver nodes the destination of route, the node that has a route to destination or none of both. In the two first, receiver uncast a Route Reply (RREP) packet to the route that received Route Request (RREQ) packet. The route that RREP packet traverses, selected as one of the main routes for source that has been sent RREQ packet [4] Simple flooding technique is the most reliable method in terms of coverage but too many redundant messages are generated. Therefore, several methods like counter -based, probability-based, location-based and distance-based method shave been introduced to reduce the number of unnecessarily forwarded messages. However, drawbacks incurs such as long delay time resulted from beacon messages among neighboring nodes and packet collisions due to many packets sent in the one-hop communication range.[5]

2. RELATED WORK: PAODV

Always routes are suitable for routing that satisfy some conditions such as delay, throughput, hop count, control overheads, number of broken link and etc. Decreasing number of hops leads to shorter route for data transmission .Decreasing number of broken links leads to more

stable routes. These two conditions decrease control overhead and packet loss. Mobility prediction can satisfy those terms, especially decreasing broken links static routes have less route discovery and route maintenance phases because they are manually contain values; hence decrease routing over heads but to decrease overhead ,number of discovered route must be reduce overhead,. To reach this, some restrict nodes that want to receive route request packet. It is clear that transmission phase uses only some routes that have been found between any pair of source and destination.

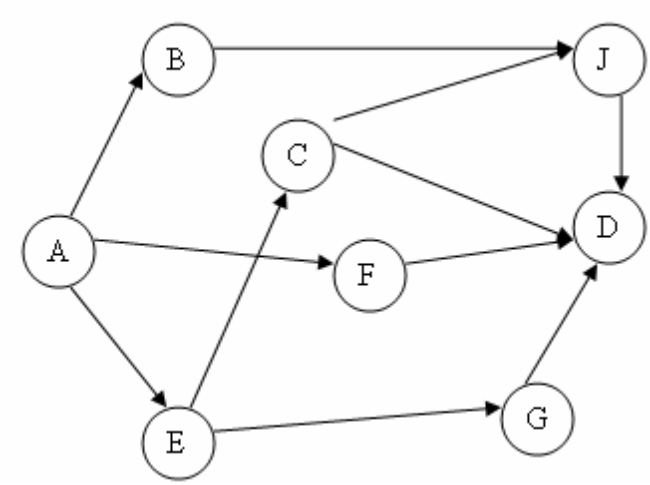

Figure (1), routers overhead

In figure (1), node A is source and node D is destination. Therefore, node A must find a route to node D. For this, node A broadcasts RREQ packets to its neighbors. Nodes B, E and F receive this packet and each one of them searches its routing table, if one of them has a route to D, it will uncast route reply packet to node A. Otherwise, they must rebroadcast RREQ packet to all neighbors except node A. This process is repeated until node D receives RREQ packet. Then, it sends RREP to pervious nodes. After route discovery phase, all routes that are found between nodes A and D are : (A, B, J, D), (A, E, C, J,D), (A, E, C, D), (A, E, G, D), (A, F, D) hence these routes are more than those need for sending data, so wastage of bandwidth took place.[2]

To remedy this problem in PAODV, two parameters are used, firstly number of routes will be restricted by restricting the number RREQ packets. Second, protocol can select nodes which this restricted RREQ packet must be send to them. It can be done by dividing the area around the nodes.

3. AODV MOBILITY

To avoid sending data through the congested network area, firstly the capacity of network find out with respect to type of service .To estimate the capacity of the existing access

attempts by calculating Channel Availability (CAV) from link-level traffic The T busy can be calculated as the cumulative NAV time That each node overhears from any transmission over a period of time called Specified Time Period, which can be pre-defined value for the rate of CAV calculation, and it is Chosen to be longer than the sum of Trusty' the rate of calculation depends of how much accurate of routing information is needed. However, a higher calculation rate can cause significant overhead, [6]

4. ISSUES AND CHALLENGES

Uncooperative behavior in VANET, such as message modification and dropping, could substantially lower the message delivery ratio and further affect the safety of other vehicles.

In broadcasting or flooding the data item lot of bandwidth loss took place. It may cause the congestion in network, deceases the throughput and delay increases. Therefore, new distributed mechanisms should be designed to promote cooperation in VANET for robust message disseminations

5. CONCLUSIONS

This article has presented the different strategy of efficiency improvement of AODV routing protocol in VANET with the help of channel availability .To reduce the routing overhead and router length by using the PAODV protocol selection about the allowable RREQ and distance threshold can satisfy the goals about the route stability and overhead.

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