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Implementation Of Flow Oriented Routing Protocol In Vanet

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Abstract: This paper, suggested the technique of flow oriented protocol which would be helpful in traffic control mechanism on the road. Here the vehicles are connected with some predicted route and its lifetime. With the help of REQ and RET packet the route maintenance is provided within the network. There is large number of protocols for the MANET but I found this one as suitable as continuous link updates are stored in the route table information **maintained at each node.**

Keywords: FORP, RET, REQ,LET, multihop Handoff, Route Establishment, Route Maintenance etc.

I. INTRODUCTION:

Today the VANET is an emerging technology where most of the research work is going on. Because of the increase in population. And increase in traffic on road, the accidents are happening more in the cities and in highways. So by applying some methods of retention and alerts we can avoid the road accidents in future. Here in this paper I have suggested the flow orientation protocol for the control of traffic on road with the help of mobile adhoc network.

II. PROPOSED SCHEME

FLOW ORIENTED ROUTING PROTOCOL (FORP) is an on demand routing protocol that employs a prediction based multi-hop-handoff mechanism for supporting time- sensitive traffic in ad hoc wireless networks. This protocol has been proposed for IPv6 based ad hoc wireless networks where the quality of service (QOS) needs to be provided. The multihop handoff is aimed at alleviating the effects of path breaks on real time packet flows. A sender or an intermediated node initiates the route maintenance process only after detecting a link break. This reactive route maintenance procedure may result in high packet

Loss, leading to a low quality of service provided to the user. FORP uses the unique prediction based mechanism that utilizes the mobility and location information of nodes to estimate the link expiration time (LET). LET is the approximate lifetime of a given wireless link. The minimum of the LET values of all wireless links on a path is termed as a route expiry time (RET). Every node is assumed to be able to predict the LET of each of its links with its neighbors. The LET between two nodes is estimated using information such as current position of nodes, their direction of the movement and their transmission ranges. FORP requires the availability of GPS information in order to identify the location of nodes.

a. Route Establishment In FORP

When a sender node needs to set up a real time flow to a particular destination, it checks its routing table for the availability of a route to that destination. If the route is available, then it is used to send the packet to that destination. Otherwise sender broadcasts flow REQ packet carrying information regarding the source and destination nodes. The flow REQ packet also carries the flow identification number/sequence number which is unique for every session. A neighbor node on receiving

this packet, first checks its sequence number of the received flow REQ is higher than the sequence number corresponding to the packet belonging to the same session that had previously forwarded by the node. If so then it updates its address on the packet and extracts the necessary state information out of the packet. If the sequence number of the packet is less than previously forwarded packet, then the packet is discarded. This is done to avoid looping of Flow-REQ packets. A Flow –REQ with same sequence number as that of a flow REQ belonging to the same session which had been forwarded already by the node, would be broadcast further only if it has arrived through a shorter (and therefore better)path. Before forwarding the flow REQ, the intermediate node appends its node address and the LET of the last link the packet had traversed onto the packet. The Flow REQ packet when received at the destination node contains the list of the nodes on the path that it had traversed, along with the LET values of every wireless link on that path. FORP assumes all nodes in the network to be synchronized to a common time by means of GPS information. If the calculated value of RET corresponding to the new flow REQ packet arrived at the destination, is better than the RET value of the path currently being used, then the destination originates a flow-SETUP packet. The LET of a link can be estimated given the information about the location, velocity, transmission range of the nodes concerned. The LET of the wireless link between two nodes say m and n with transmission range Tx , which are moving at a velocity Vm and Vn at angles Tm and Tn respectively can be estimated as described below

$$LET_{mn} = \frac{(pq + rs) + (p^2+r^2)\,Tx2 - (ps - qr)^2}{P^2+q^2}$$

Where, $p = V_m \cos T_m - V_n \cos T_n$

$q = X_m - X_n$

$r = V_m \sin T_m - V_n \sin T_n$

$s = Y_m - Y_n$

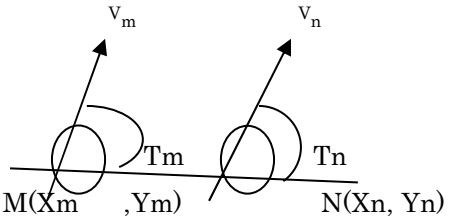
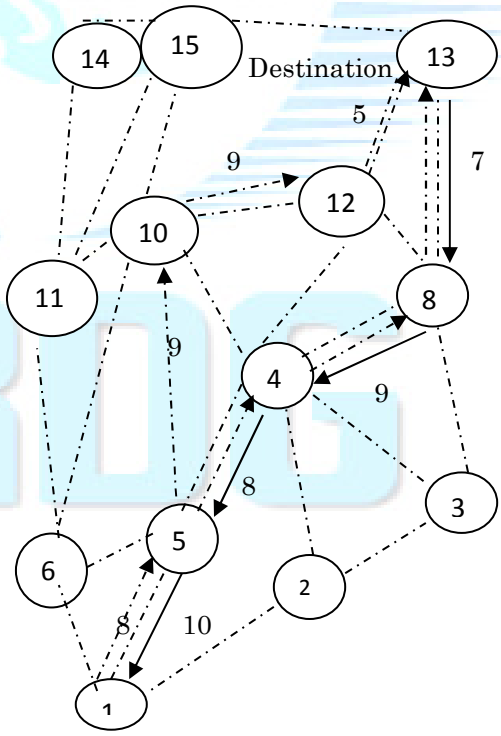


Figure 1: Calculation of LET

The Route Establishment process is shown in figure 2, In This Case, the path 1-5-4-8-13(path 1) has a RET value of 7, whereas the path 1-5-10-12-13 (path 2) has a RET value of 5. This indicates that path 1 may last longer than path 2. Hence the sender node originates the Flow Set Up through the reverse path 13-8-4-5-1

FORP employs a proactive route maintenance mechanism which makes use of the expected RET of the current path available at the destination.



Flow REQ

Network Link

Path M 1-5-10-12-13

RET = 5

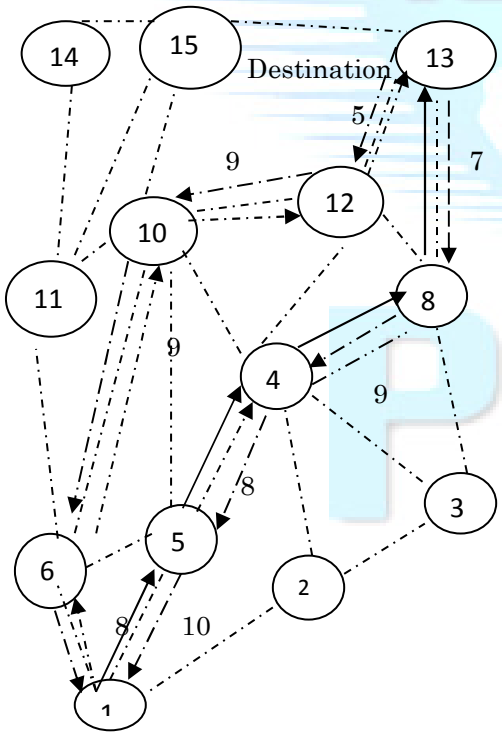
PATH N 1-5-4-8-13

RET= 7

Figure2: Route Establishment Process

b. Route Maintenance In FORP:

The Route maintenance is illustrated as shown in figure 2.When the destination node determines that a route break is about to occur within a critical time period (tc), it originates the flow Handoff packets to the source node. Which is forwarded by intermediate nodes The mechanism by which the flow Handoff packets are forwarded is similar to Flow REQ forwarding Mechanism



Existing path

Flow handoff

New Path

1-6-10-12-13

Network Link

Figure3: Route Maintenance in FORP

III. CONCLUSION:

Here in this algorithm we can say that the efficient way of communication is performed within the network as the packets every time selecting the new route prior to their lifetime expiry. In VANET we can implement this protocol to make connectivity all the time till the expiration of the route. So the possibility of accidents on the road are removed. And the safety of the society is provided on the road. This adds the contribution to the saving of human life.

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