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Inspecting Vanet for Determined Ways with Watertight Connectivity

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Abstract: *This paper is examining the VANET techniques by understanding the various papers published by the authors in IEEE transactions. In this paper the new technique is explored where no of the routing method is applied for connecting the nodes. But using the other information such as speed ,density,time,range and calculating the time required by the vehicle on the road of interests we can link them full time period of their run. We can use the standard frequency bands widths allocated by the Governments*
Keywords: *VANET; MANET; ADHOC Network; Routing; Link Time, RREQ packet; RF Packet etc.*

I. INTRODUCTION

VANET is an emerging technology and the concept of VANET arrives from the MANET technique. In MANET there are various routing methods which is applied to the ADHOC network. It uses the theory of wireless networks. Wireless networks are computers that use radio frequency channels as their physical medium for communication. Each node in the network broadcast information which can be received by all nodes within its direct transmission range. Since the nodes transmit and receive over the air, they need not be physically connected to any network. Hence the network offers data connectivity along with user mobility.

The World's first wireless radio communication system was invented by GUGLIELMO Marconi in 1897. In 1901, he successfully demonstrated his wireless telegraph system to the world by transmitting radio signals across the Atlantic Ocean from England to America, covering more than 1700 miles. Through his system , two end users could communicate by sending each other alphanumeric characters that were encoded in an analog signal. This signaled the beginning of the radio communication era. Wireless communication is one of the fastest growing industries in the world. The wireless communication industry has several segments such as cellular telephony, wireless LAN's and satellite- based communication networks.

In VANET, it uses the wireless communication to communicate with nodes using radio frequency signals. VANET is S based on the principle of broadcast and reception of electromagnetic waves. Since the electromagnetic spectrum is a common resource which is open for access by anyone. The VANET system can make use of this spectrum for allocation of frequency band for VANET.

One very important property that an ad hoc wireless network should exhibit is organizing and maintain the network by itself

II. ISSUES IN VANET

Medium Access Scheme: The primary responsibility of a medium access control (MAC) protocol in an ad hoc wireless networks is the distributed arbitration for the shared channel for transmission of packets

Routing: The responsibilities of a routing protocol include exchanging the route information; finding the physical path to a destination based criteria such as hop length ,minimum power required, and the lifetime of the wireless link; gathering information about the path breaks;

Mobility: The Mobility Of nodes result in frequent path breaks, Packet collision, transient loops, stale routing information and difficulty in resource reservation. So how to solve the route forming in the fast mobile nodes.

Bandwidth Constraint: Since the Channel is shared by all nodes in the broadcast region, The bandwidth available per wireless link depends on the number of nodes and the traffic they handle

Location dependent contention: the load on the wireless channel varies with a number of nodes present in a given geographical region. This makes the contention of the channel high when the number of nodes increases.

Quick Route reconfiguration: The unpredictable changes in the topology of the network require that the routing protocol be able to quickly perform route reconfiguration in order to handle path breaks and subsequent packet losses.

Security and privacy: The routing protocol in VANET must be resilient to threats and vulnerabilities. It must have inbuilt capability to avoid resource consumption, denial –of- service, impersonation and similar attacks.

Road constraint: the length and width of the road is fixed. the nodes must communicate within limits; Stable routes: the need of stable routes is the most urgent issue in VANET; Continuous Link: another important issue is continuous link for communication

III. RELATED PROTOCOLS

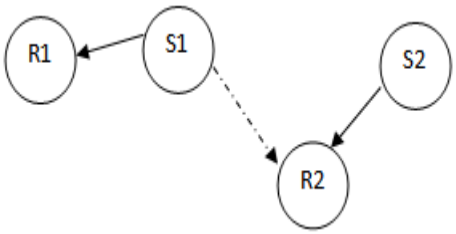
Many authors suggest that the routing protocols of MANET are used for VANET, In routing Techniques the major activity is neighbor discovery. During Neighbor discovery phase, every node in the network gathers information about its neighbors and maintains that information in appropriate data structures. This may require periodic transmission of short packets named beacons, or promiscuous snooping on the channel for detecting activities of neighbors.

During the topology reorganization phase, the VANET requires updating the topology information by incorporating the topological changes occurred in the network due to mobility of nodes, failure of links

A. Macaw Protocol

The binary exponential back-off mechanism used in MACA at times starves flows.

Figure 1: Example Topology



For example consider the figure1, here both the nodes S1 and S2 keep generating the high volume of traffic. The nodes that first capture the channel starts transmitting the packets (say node S1). The packets transmitted any node S2 get collided, and the nodes keep incrementing its back-off window according to the BEB algorithm. MACAW use CTS RTS and ACK control packets.

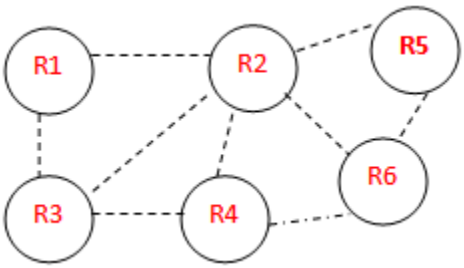
Real Time Medium Access Control Protocol: Provides the bandwidth reservation mechanism for supporting real time traffic in VANET networks. A separate set of control packets consisting of ResvRTS, and ResvACK is used for effective bandwidth reservation for real time packets

Table Driven Routing Protocol: routes to all destinations are readily available for every node at all times. In one paper the author says that DSR is better than DSDV.

B. Dynamic Source Routing (Dsr) :

DSR is a routing protocol for wireless mesh networks. It is similar to AODV in that it forms a route on-demand when a transmitting computer requests one. Dynamic source routing protocol (DSR) is an on-demand protocol designed to restrict the bandwidth consumed by control packets in ad hoc wireless networks by eliminating the periodic table-update messages required in the table-driven approach OF DSDV. The major difference between this and the other on-demand routing protocols is that it is beacon-less and hence does not require periodic hello packet (beacon) transmissions, which are used by a node to inform its neighbors of its presence. This protocol is truly based on source routing whereby all the routing information is maintained (continually updated) at mobile nodes. It has only two major phases, which are Route Discovery and Route Maintenance. Route Reply would only be generated if the message has reached the intended destination node (route record which is initially contained in Route Request would be inserted into the Route Reply).

Figure 2: Topology Graph Of The Network



C. Destination-Sequenced Distance-Vector Routing (DSDV):

Destination-Sequenced Distance-Vector Routing (DSDV) is a table-driven routing scheme for ad hoc mobile networks based on the Bellman–Ford algorithm. Each entry in the routing table contains a sequence number, the sequence numbers are generally even if a link is present; else, an odd number is used. The number is generated by the destination, and the emitter needs to send out the next update with this number.

Ad-Hoc on Demand Distance Vector Routing (AODV):

Ad-Hoc on Demand Distance Vector Routing uses on demand approach for finding routes. That is route is established only when it is required by source node. For transmitting data packets. It employs destination sequence numbers to identify the most recent paths. The major difference between DSR and AODV stems out from a fact that DSR uses source routing in which a data packet carries the complete path to be traversed. However in AODV, the source node and the intermediate nodes store the next hop information corresponding to each flow for data packet transmission. In AODV protocol, the source node floods the RREQ packet in the network, when the route is not available for the desired destination. And RREP packet for reply mode. And if error occurs then RRER packet is used for error forwarding message.

D. Signal Stability Based Adaptive Routing Protocol:

SSBARP is an On Demand protocol that uses signal stability as a prime factor for finding stable routes we can make use of bus transportation system their schedules for best packet delivery protocol is beacon based. In which the signal strength of the beacon is measured for determining the link stability. The signal strength is used to classify a link as stable or unstable

Every node maintains a table that contains the beacon count and the signal strength of each of its neighbors. If the node has received the strong beacons for the past few beacons, the node classifies the link as a strong stable link. The link is otherwise classified as a unstable link. Each node maintains a table called a signal stability table (SST)

IV. RELATED WORK

The some of the Authors said that stable route is the important factor for VANET; Next important factor is how to form a route. They said that number of above techniques can be used, but in that we have to add stable route and packet transmission seamlessly.

1. In one IEEE Transaction paper on" A stable routing protocol to support its services in VANET networks; IEEE transactions on Vehicular Technology Vol 56,no 6 November 2007;Tarik Taleb, Ehssan Sakhaee" , The author Tarik Taleb and others explains the idea about grouping of vehicles to forward the packet delay and reduce the traffic. Therefore each group will forward the packet in the same direction of moving vehicles Which is one of the good strategies for forwarding technique.. If the vehicle forwards the message to different group vehicle then penalty is added and it is considered as unstable route. And the location of nodes is found out by the GPS system installed in each device or say vehicles..In GPS system the X, Y coordinates are easily available for all the moving vehicles. Location is detected in every 1 second time interval
2. In 2nd paper the author proposed the beacon message is used by all the vehicles to inform about speed ,direction and position of each other vehicle in the vicinity, they said that performance of the GPSR is improved
3. In other paper, the author explains that predicted routes are already stored in the buffer inside the device so that even if failure occurs, already stored route can then be taken for delivery of packets. So that creates a stable route.
4. In another paper, the author said we can make use of bus transportation system for communication on the road. Bus transportation has fixed schedules. Buses are occupying the fixed route from source to destination and the timing is also fixed for them. Also bus move slowly than fast moving cars, also we don't know the

path of the cars. And the cars are less in number on roads. And only one interface can be given to each car but bus can provide more than one interface. So they can be the best source for transmission of packets. They can be used as a relay system on the road.

5. In one paper the author said that road side units are fixed unit so they can be used for storing the predefined routes for the vehicles on the road. If route failure occurs then another route can immediately from the Roadside units and packets are delivered
6. In one paper the probability of breaking the route is found out. And the predefined routes are stored. Probability of vehicle density on the road at a particular time is also taken and range is also taken and using OPNET simulator the results show that DSR is better than DSDV
7. The Securiy of Vehicular adhoc Networks,2005by by Maxim Raya ,Jean – Pierre Hubaux. Vehicular networks implement the detail threat analysis and provide security and privacy and analysis of the robustness of the security protocols. He carries out the quantitative assessment of the proposed solution

In all the above work the route is first found out from source to destination node and then packets are forwarded and for maintaining that route, different techniques are used so that connectivity can be shown between nodes. And even if route breaks, the new routes are set. but i suggest that if continuous connectivity is directly shown between all the nodes there is no need of forming route and then send the packets from source to destination only, the packets can be sent from any node to all other nodes

V. Proposed Work

Geographic routing (also called Georouting or position-based routing) is a routing principle that relies on geographic position information. It is mainly proposed for wireless networks and based on the idea that the source sends a message to the geographic location of the destination instead of using the network address.

Geographic routing requires that each node can determine its own location and that the source is aware of the location of the destination. With this information a message can be routed to the destination without knowledge of the network topology or a prior route discovery. But with some other information in the packet

In this I have taken the concept of GPS system to locate the position of nodes using X and Y coordinates of each vehicle. Vehicle positions of x and y coordinates are created. After that, total time at which the vehicle is on the road is found out. That is, time matrix is created

The point of Distance at which vehicle starts and the last maximum distance is taken which is the total approximate distance, the vehicle will run.

The speed of each vehicle is calculated, distance of each vehicle is found out using the DSDV

There is no need of any routing technique here.

Road length and Road width is taken in consideration Speed is taken in consideration Distance is taken in consideration ;GPS system is taken in consideration; Distance vector is created ;Distance between two points is found out; Angle between two points is found out ;Example : Suppose There Are Two Vehicles Say i and j Speed of the Vehicle i is Vi; and Speed of the Vehicle j is Vj; Taking the formula, Speed = Distance / Time

Distance to be covered for the Vehicle i = R –|di| ;Di is the starting point (distance)at which the vehicle 1 is starting his ride;(Di is the X value of i vehicle and Dj is the X value of j vehicle); Dj is the starting point(distance)at which the vehicle2 is starting his ride; Each two vehicle has X1,Y1 and x2 y2 coordinates

The speed of each vehicle we know in km/sec which is tracked from Speed Sensors and GPS device

But since we do not know time initially, we find time from the speed of the vehicle and its total distance covered by the vehicle on the road. Distance say D is the maximum travel distance of the vehicle say i from its starting position = R-di = 500-di And Z is Angular Distance between two vehicles = $SQRT(x2-x1)^2+(y2-y1)^2$;Using the distance between two vehicles distance matrix is created Using time sensors the time can be measured time = distance covered (d)/ speed(v) ;Time of travel of vehicle 1 = (500-di) / speed1 Time of travel of vehicle 2 = (R-dj)/ speed2; Time of each vehicle can be found out

Taking the total time of travel of vehicle on the road, we can show the connectivity between vehicles for that total time period

If, x_2 and y_2 are the x, y coordinates for one point

If x_1 and y_1 are the x,y coordinates for the second point

if d is the distance between the two points; Then we can say that following equation will be formed for finding the distance between two points.

So vehicle 1 takes time t1 seconds and vehicle 2 takes time t2 seconds then, Time of connectivity between the two vehicles is the minimum time taken between the two vehicles; Total time required by the two vehicles at which they can be connected = min(t1,t2) seconds; Z is the distance between the two vehicles is, distance = $SQRT(x2-x1)^2+(y2-y1)^2$;From the standard Mathematical formula , for finding the Angle theta between two vehicles, vehicle 1 and Vehicle2

Ø= $\tan^{-1}$ [(y2-y1)/(x2-x1)] ; R=500; Z is the distance between the two vehicles is, distance = SQRT(x2-x1)^2+(y2-y1)^2
Speed Is Tracked Using GPS System, Required travel Distance (D)= R - Current Distance(Starting Point)
Time = Required Covered Distance (D) / Speed(V) Ex : Total time required by the two vehicles at which they can be connected = min(t1,t2) seconds; Speed And Position Is Tracked By GPS System in Every 1 Second Interval. Angle Ø Is Known Required Travelled Distance Is Known. Speed is known, distance between two nodes is known, So Using All These Information The Link Is Made Using The Packet Information As (R,V, Ø, TIME, X,Y, Z) for each vehicle. As all the nodes are known at a single time we can connect all of them for their time on road, and using GPS System continuous RF packets having all the information and RREQ packets showing the information about other nodes is sent

VI. PERFORMANCE ANALYSIS

A. The challenge in VANET:

The design of routing protocols for VANETS must achieve the low communication overhead, Low latency delay, the low time cost, and high adjustability for the city, highway, and rural environments, Broadcast storm problem, large scale deployment, collision avoidance, traffic congestion. This happens due to lack of connection between the nodes. Because of frequent route breakes.because of high mobility pattern of nodes. In different proposed routing methods for VANET, the prolong connectivity is not shown because each routing method has to search the location of the neighboring nodes, and then connect, again optimum path is found out to send the packet in the route. But if we know the location, distance and time of nodes then we can connect them throughout of their total runtime. Many of the algorithms suggested the distance and position parameter for finding the location of nodes.

B. Research contribution

1. New parameters are generated- distance1,distance2, link-time, position of nodes
2. From distance1 parameter , Distance vector is generated for all nodes
3. incessant connectivity between nodes is shown
4. Overhead of the nodes are reduced
5. Large scale deployment are covered
6. Traffic congestion is avoided

C. Comparision of SBAPM with GPCR,AODV,CBR

In SBAPM Method, the less number of nodes get disconnected in the route.while GPCR, AODV and CBR will get a continuous disconnection because of their topology structure.The Following Figure 1: showing the topologies of GPCR,CBR,AODV and SBAPM. Figure2: three tables represent the values of nodes in range for break nodes.and figure 3 represent the graphs from the break nodes giving the values in percentage for breking of nodes.Figure 4 shows the range of connection for SBAPM versus GPCR, AODV and CBR.The connectivity range of SBAPM is greater than all the other protocols AODV,CBR,GPCR etc. therefor break range is lesser in SBAPM than other topologies.

VII. REFERENCES

[1]. Mobisys13 The 11th Annual International conference on Mobile systems, Applications and Services Taipei Taiwan June 25-28 2013 ACM new York NY ,USA @ 2013
[2]. A Novel Geographic Routing Strategy Over VANET,2010 IEEE 24TH International Conference On Advanced Information Networking And Applications Workshops: Yan Bo Wang,Tin Yu Wu
[3]. A NEW Cluster Based Routing protocol for VANET, 2010 2nd International Conference on Network Security Yuyi Luo
[4]. Study of feasibility of VANET and its routing protocol, 2008 IEEE,SUN Xi,LI Xia Miao
[5]. Distance routing Effect algorithm for mobility(DREAM(1998))by S Basagni, I Chlamtac, V R Syrotiuk, B A Woodward IN the proceedings of the 4th annual ACM/IEEE International Conference on Mobile computing and Networking,ser . MobiCom'96
[6]. A Methodology for Studying VANET Performance with Practical Vehicle Distribution in Urban Environment
[7]. The Securiy of Vehicular adhoc Networks,2005by by Maxim Raya ,Jean – Pierre Hubaux.

VIII. BIBLOGRAPHY

[1]. Pradnya kamble ,she is a professor at PCE,Nagpur,and presently doing Ph.D. research in VANET systems
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