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The Research on efficient data dissemination in vehicular ad hoc network with HNDT (helper data node technique) with APAL algorithm

Shivani julka, Nitin Bhagat

***Abstract*— A Vehicular Ad Hoc network (VANET) is a kind of wireless ad hoc network to provide communication among vehicles and nearly road side equipment or communication between vehicles on roads. Every day, many people are injured in accidents and most of them die .so the desire to improve safety among vehicles was the main motivation in the development of the VANETs. VANETs are a promising approach to enable communication among vehicles .They are special form of mobile ad hoc network (MANET). VANET is becoming an integral technology for connecting daily life to computers. They could greatly improve the driving experience in terms of safety and efficiency. VANET enables a vehicle to communicate with each other which are out of sight or even out of radio transmission range. It enables vehicles to communicate with roadside equipment. we proposed technique with HNDT(helper data node technique) data node technique with APAL algorithm for better data dissemination**

***Index Terms*— data dissemination,APAL,VANET,HNDT**

I. INTRODUCTION

Efficient traffic management is becoming of great interest today as traffic congestion becomes a more and more severe problem. Throughout the world millions of hours and gallons of fuel are wasted everyday by vehicles stuck in traffic. Therefore, congested flow conditions have a negative impact on the economy, health, and environment. The improvement of traffic flow and congestion reduction can be achieved by means of Traffic Information Systems (TISs) . In general, the aim of TIS is to capture, evaluate and disseminate traffic-related information. Conventional technologies (e.g. Traffic Management Center (TMC) and Road Data Services (RDS)) in TIS offer very restricted

1.clustering of vehicle : in a clustering structure the vehicle nodes are divides into number of virtual groups based on c certain rules.these virtual groups are called clusters [3]. Equipped vehicles form dynamic clusters and the ones that are more adequate become cluster head. CH is responsible for controlling the data propagation inside and between the clusters. The dynamic clusters are themselves mobile, moving along with the high-speed vehicles; this ensures that even with high-speed vehicles, the moving cluster architecture result in

relatively stable topology, as long as velocity of the vehicles remains more or less the same.[1]

2. chaning of clusters : chaining of clusters could be don by the CH. The clusters members in a clusters communicate with their CH. This CH node can communicate beyond the clusters boundaries using a clustyer control channel. Then send this status information to the next CH node which in turn transmits the information to next CH node. The process repeated and forms chaining in clusters until the one of the CH node that have received the packets in the communication range of RSU [1].

Shivani julka, Student, M.Tech (CSE), PTU
Nitin Bhagat, Assistant Professor, PTU

II. RELATED WORK

Hamid [1] analyzes cluster formation procedure ,maintainance and chaining between clusters. In this paper,we discuss the three step approach for estimation of traffic volume in a road segment based on actual volume of wireless equipped vehicles. The first step is to collect the traffic information of different groups of vehicles. Then a chaining technique between the clusters are used to transmits the information to the road side cloud. Then the last step is to employ a generalization method to the extension of the total traffic volume from the collected data.

Rasmeet [2] said thatOver the last few years, Vehicular Ad Hoc Networks (VANETs) have emerged as a new class of efficient information dissemination technology among communities of users mainly because of their wide range of applications such as Intelligent Transport Systems (ITS), Safety applications, and entertainment during the mobility of the vehicles. Vehicles in VANETs act as an intelligent machine, which provides various resources to the end users with/without the aid of the existing infrastructure. But due to the high mobility and sparse distribution of the vehicles on the road, it is a challenging task to route the messages to their final destination in VANETs. To address this issue, clustering has been widely used in various existing proposals in literature. Clustering is a mechanism of grouping of vehicles based upon some predefined metrics such as density, velocity, and geographical locations of the vehicles. Motivated from these factors, in this paper, we have analyzed various challenges and existing solutions used for clustering in VANETs. Our contributions in this paper are summarized as follows: Firstly, a complete taxonomy on clustering in VANETs has been provided based upon various parameters. Based upon this categorization, a detailed discussion is provided for each category of clustering which includes challenges, existing solutions and future directions. Finally, a comprehensive analysis of all the existing proposals in literature is provided with respect to number of parameters such as topology selected, additional infrastructure requirements, road scenario, node mobility, data handled, and relative direction, density of the nodes, relative speed, communication mode, and communication overhead. The analysis provided for various existing proposals allows different users working in this domain to select one of the proposals with respect to its merits over the other Zaydon [4] states that Clustering in vehicular ad hoc networks (VANET) is one of the control schemes used to make VANET global topology less dynamic. Many of the VANET clustering algorithms are derived from mobile ad hoc networks (MANET). However, VANET nodes are characterized by their high mobility, and the existence of VANET nodes in the same geographic proximity does not mean that they exhibit the same mobility patterns. Therefore, VANET clustering schemes should take into consideration the degree of the speed difference among neighboring nodes to produce relatively stable clustering structure. In this paper, we introduce a new clustering technique suitable for the VANET environment on highways with the aim of enhancing the stability of the network topology. This technique takes the speed difference as a parameter to create relatively stable cluster structure. We also developed a new multi-metric algorithm for cluster-head elections. A simulation was conducted to evaluate our method and compare it with the most commonly used clustering methods. The simulation results show that our technique provides more stable cluster structure on the locale scale which results in a more stable network structure on the global scale. The proposed technique reduces the average number of clusters changed per vehicle by 34-46%, and increases the average cluster lifetime by 20-48% compared to the existing techniques. M hari prasad [6] said that Vehicular ad hoc networks (VANETs) are a promising technology to enable the communications among vehicles and between vehicles and road side units (RSU). A new algorithm to construct Stable clusters is introduced to perform cluster based routing (CBR) and to improve the performance of VANETs. The stable clustering algorithm groups the nodes based on the position and direction information to form stable clusters and elects cluster head based on a multi-metric algorithm. This method reduces the overhead of re-clustering and lead to an efficient hierarchical network topology. The proposed system is evaluated using simulation software NS2 (Network Simulator 2). The performance parameters include throughput, propagation delay and average cluster change per vehicle. Simulation results reveal that there is increase in throughput, and decrease in propagation delay and average cluster change per vehicle.

Shou – chih lo [7] said that Clustering is an important research topic in wireless networks, because cluster structures can facilitate resource reuse and increase system capacity. In this paper, we present a new clustering algorithm that considers both node position and node mobility in vehicular ad hoc environments. The proposed algorithm intends to create stable clusters by reducing re clustering overhead, prolonging cluster lifetime, and shortening the average distance between cluster heads and their cluster members. Most important, this algorithm supports single and multiple cluster heads. Simulation results show the superiority of our clustering algorithm over the other three well-known algorithms.

III. PROPOSED WORK

PROPOSED SCHEME APAL algorithm

1. When receive alert message
2. IF (receive alert message is for first time)
3. $\Delta\tau_I$ random between 1-100 ms
4. P_i random probability between 0.7-0.9
5. END IF
6. Count time = 0
7. Duplicate number =0
8. WHILE (Count time $<\beta$ && duplicate number is $>\alpha$)
9. WHILE ($\Delta\tau_I$ is not expired)
10. Listen for duplicate alert message
11. Count = number of received duplicate alert message.
12. END WHILE
13. IF(receive duplicate alert message)
14. Duplicate number = duplicate number + count
15. $P_{i+1} = p_i$/ duplicate number
16. $\Delta\tau_{i+1} = \Delta\tau_I *$ duplicate number
17. ELSE
18. Rebroadcast with p_i
19. IF (rebroadcast is successful)
20. $P_{i+1} = p_i/2$
21. $\Delta\tau_{i+1} = \Delta\tau_i$
22. END IF
23. END IF
24. Count time = count time + $\Delta\tau_i$
25. END WHILE

This algorithm is mainly designed to curve the problems caused by both flooding of messages and restricted transmission. In detail, when a message is broadcasted indiscriminately, like in the case of flooding algorithms it leads to various broadcast storm problems, like collapse of ad-hoc networks, serious contention and collision. On the other side, restricted transmission may lead to immature death of the alert message. To curve the problems caused by flooding algorithms and restricted transmission,

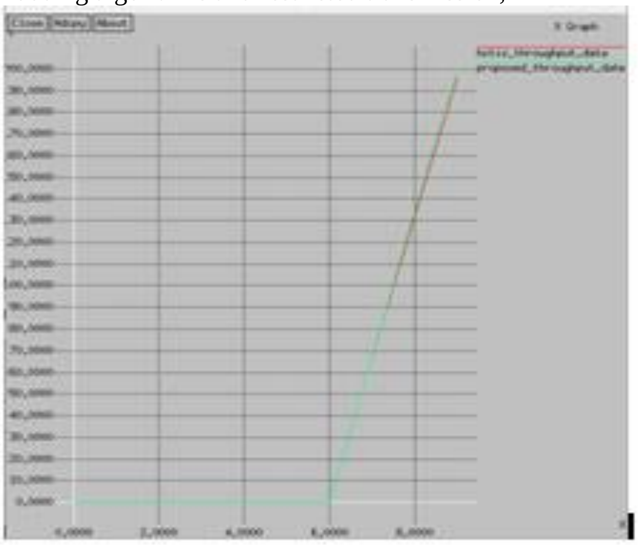

Fig. 1 Throughput of proposed technique and previous technique

Fig 1 xgraph shows the throughput comparison obtained from the simulation carried out on nodes between the proposed Technique and Previous technique proposed technique results are better than existing approach

No of Nodes	Existing approach	Proposed Approach

5	52.00%	58.75%
20	67.75%	71.75%

Table1 Performance Analysis of Throughput

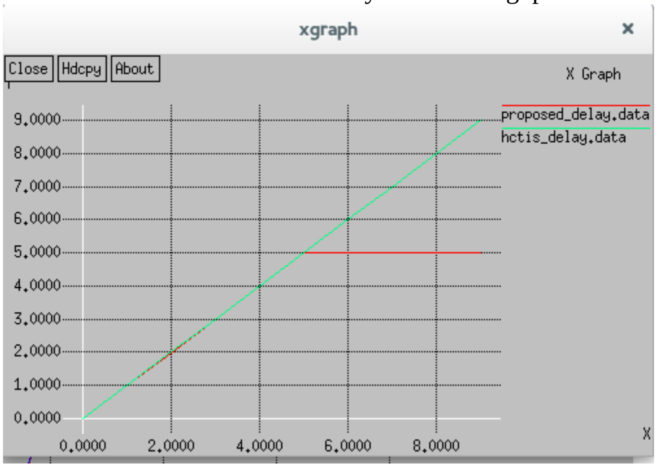

Fig 2 Shows the comparison of end to end delay of existing and proposed approach. the proposed technique shows better result than previous technique.

No of Nodes	Existing approach	Proposed Approach
5	47.56%	40.37%
15	52.35%	53.37%

Table 2 Performance Analysis of End To End Delay

The existing approach shows better result than previous approach

IV. CONCLUSION

In vehicular Ad-Hoc networks the technology is changing very fast, the various algorithms are used for better data transmission a best algorithm is proposed according to the requirement. The efficient data dissemination techniques can provide significant benefits to vehicular ad hoc networks, in terms of both performance and reliability. Many data dissemination techniques for such networks have been proposed so far. Amongst the most popular one is helper data system. This popular technique used to choose the reliable node for continuous data transmission. The propose technique is used to choose selective node for forwarding the data with carry forward technique.   .In future work, various data dissemination technique can be done with the help of various algorithm for efficient data security.

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