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Improved greedy routing protocol for VANET

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Abstract: *VANET (vehicular ad-hoc network) is a classification of MANET in which vehicles act as mobile node and provides a different approach to Intelligent transport System (ITS). VANET is an emerging area for Intelligent Transportation System (ITS) which can result in increased traffic safety, collision warning through exchange of messages through wireless media. Efficient routing protocols are required for efficient communication among vehicles. In the given paper, we surveyed various VANETs protocols like GPRS, GPRS-MV & GPSR. We compare our proposed protocols via NS-2 based simulations and show the performance of different protocols.*

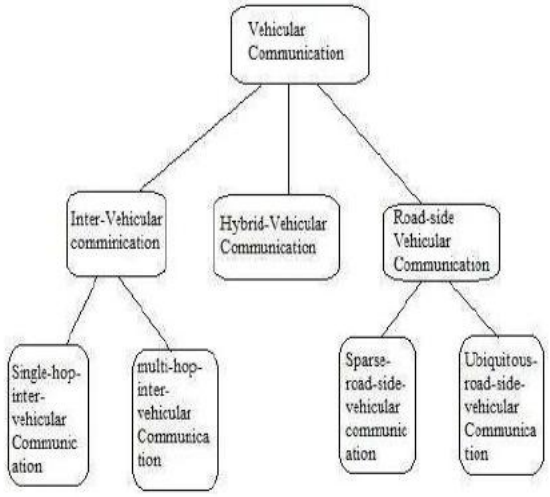
I. INTRODUCTION

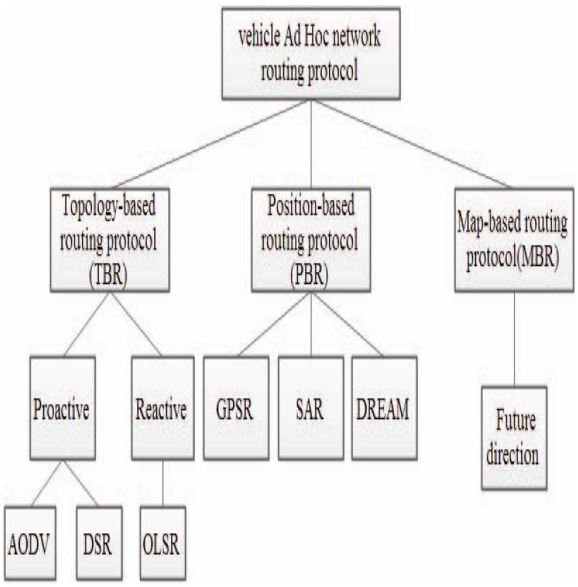
Now a day's most up-to-date automobile have intra conveyance network that permits wireless communication between vehicle and electronic gadgets like sensible phone,world Positioning System (GPS) ,Bluetooth media players. However the inhume conveyance communication network remains not accessible. Thus to supply inhume conveyance communication VANET i.e. conveyance ad-hoc Network technologies are rising conveyance unintentional networks (VANETs) are outlined as a set of mobile unintentional networks (MANETs) with the identifying property that the nodes gift in here are vehicles. So node i.e. vehicle movement is restricted by road course, encompassing traffic and traffic laws. VANET is supported by some fastened infrastructure that assists with some services of the VANET and provides access to stationary networks. The fastened infrastructures are deployed at crucial locations like roadsides, service stations, dangerous intersections or places with risky weather. VANET may be a special kind of painter during which vehicle communicate with one {another} by making an Adhoc network and it moves with a high speed. VANET stands for conveyance Adhoc network that is incredibly huge network and manage the road traffic and supply the answer to daily traffic issues. This network has improved the road safety and improves the traffic efficieny and provides support to sizable amount of applications .Vanet will increase comfort, avoids traffic jams, decrease travel times and makes the graceful traffic flow. In this nodes are autonomous and play the role of router and host at same time. Vehicles are often personal or belong to a personal or public and supply promising communication to drivers and passengers. Developing real time safety And non-safety applications for conveyance Adhoc network(VANETs) need understanding of the dynamics of the network topology characterics since these dynamics verify each the performance of routing protocols and therefore the feasibleness of an application over VANETs.

II. Intelligent transportation (ITS)

Intelligent transportation means that the vehicle itself acts as a sender, receiver and router for broadcasting info. As mentioned earlier, the VANET consists of RSUs and also the vehicles area unit put in with OBU, GPS, ELP, etc. ITS provides 2 sorts of communication in VANET: initial is Vehicle to Vehicle (V2V) and second is Vehicle to Infrastructure/Infrastructure to Vehicle (V2I/I2V). Fig. 1.1 shows V2V communication and V2I/I2V communication. V2V communication uses multi-hop communication (multicasting/broadcasting) for transmission of information. Inter-vehicle communication consists of 2 sorts of communication: initial is area broadcasting that produces beacons at regular interval. The most demerit of mistreatment area

broadcasting is collision of messages attributable to rather more generation of messages. Second is Intelligent Broadcasting that generates messages on demand. The collision reduces during this technique of information transmission. V2I communication uses single hop communication (RSU broadcasts message to the vehicles in range). It's a high information measure link between the vehicles and RSUs. RSUs verify the vehicle speed and if the vehicle speed is quite the limit than RSU broadcasts a message within the sort of visual warning or alarm.





			Advanteges	Disadvanteges
Routing Protocols For VANETS	Topology Based	Proactive	do not flod entire network Fast path selection	overhead to maintain table
		Reactive	do not maintain routing table	initial delay for route discovery Flood a route request
		Hybrid	Combination of proactive and reactive diferent operation stages	
	Hierarchical		Exploit clusters with similar characteristics	Overhead to maintain cluster
	Flooding		low complexity, high data reception	Flood entire network
	Position Based	Without Nevigation	Relay on local information only	Need a lovation service(LS), more prone to local maximum problem
		With Nevigation	Exploit mobility of node, less prone to local maximum	

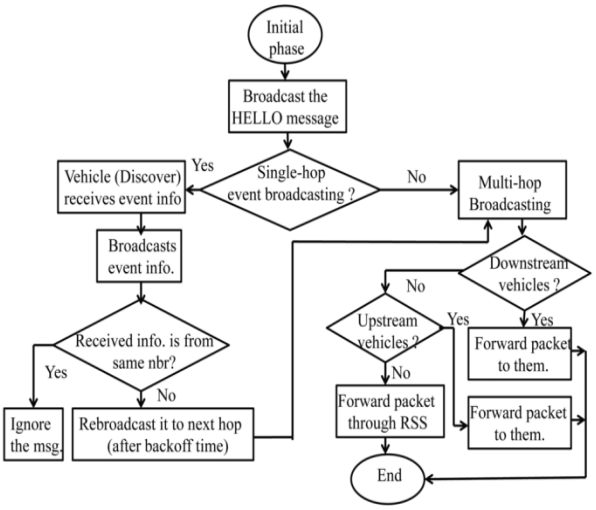
Routing protocols for VANET are unit designed for urban atmosphere wherever vehicles area unit equipped with GPS devices and wireless devices for continuous following of vehicles. The goal of routing protocols is to pick an optimal path with minimum value to dynamic behavior of VANET network its topology stick with it dynamic. Thus on assure the messages area unit delivered from supply to destination time evolving networks ought to be applied.

III.A NOVEL PROTOCOL GSPR

It is a routing technique during which a node makes its routing call with the assistance of knowledge received from GPS device. It sends packet from supply to destination supported the geographic position of car rather than mistreatment network address. It doesn't maintain any routing table or exchange link state info with another node in network. During this every node is aware of its position and its neighbor's position and uses that info to form routing call. Once the supply ought to send a packet, it stores the destination address within the packet header which is able to facilitate in forwarding the packet to the destination while not has to route discovery, route maintenance, or perhaps awareness of the configuration. It will be classified as Position based mostly greedy V2V protocols, Delay Tolerant Protocols.

Advantage: It maintains no info concerning nodes thus it reduces the overhead on network &High measurability.

Disadvantage: Dependent on GPS service.



In this flow chart it tells that how GPSR vehicles interact with each other.

IV. Simulation

In the simulation experiments, we combine the network simulation tools with traffic movement software to simulate VANET as realistically as possible. To be specific, the version 2.35 of the NS-2 simulator is used. The simulated scene map(the place where nodes move) is designed 900m*75m,as shown in Fig . The vehicle movement trace is generated by SUMO, which is a well-known and validated traffic scene simulation generator.

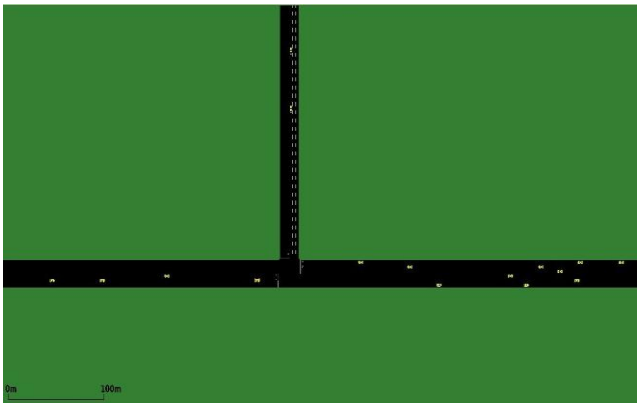


Fig: Simulation scenario

TABLE 1: Simulation setup

Parameter	**value**
Maximum communicate range	100 m
MAC type	IEEE802.11
Packet size	32 byte
Number of nodes	100-300
Vehicle speed	28 m/s

Simulation Results:

The simulation results are shown in Fig. It's discovered that the transmission delay is influenced by the amount of transmitted knowledge packets. The transmission delay will increase with the data packets' causing rate from 0pkt/s to 65pkt/s. At the same time, we are able to get the transmission delay to be: GSPS-MV<GPSR-MV<GPSR. it's as a result of the nodes'(vehicles) highspeed movement that creates the GPSR get the neighboring nodes' positions inaccurately within the how-do-you-do messages, it lags behind the position changes, and it uses the perimeter forwarding that creates the trail long and redundant once the greedy forwarding fails. However, each GPSR-MV and GSPRMV can estimate the mobile nodes' positions to get the information of the neighboring nodes comparatively accurately in one-hop, and that they use greedy forwarding with moving vector and create the trail reliable and quick. And more, GSPR-MV simplifies the perimeter mode's redundant routes, making forwarding a lot of quickly and with efficiency.

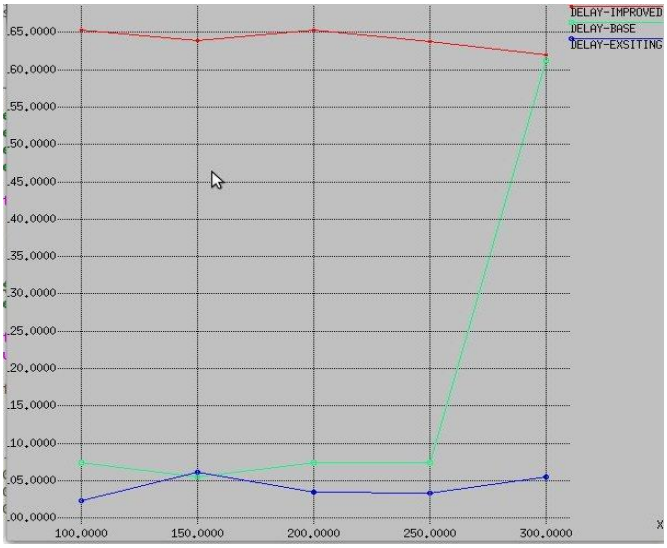


Fig: DELAY

It is observe that the Packet Delivery Ratio and throughput is improved with the increase of the number of nodes. The reason is that with the increase in the number of nodes, routing links will be easier to build, and it will be more beneficial for packets transmission. At the same time, it is easily found from the figure that both GPSR-MV and GSPR-MV have much better performance than GPSR in terms of the Packet Delivery Ratio and throughput.

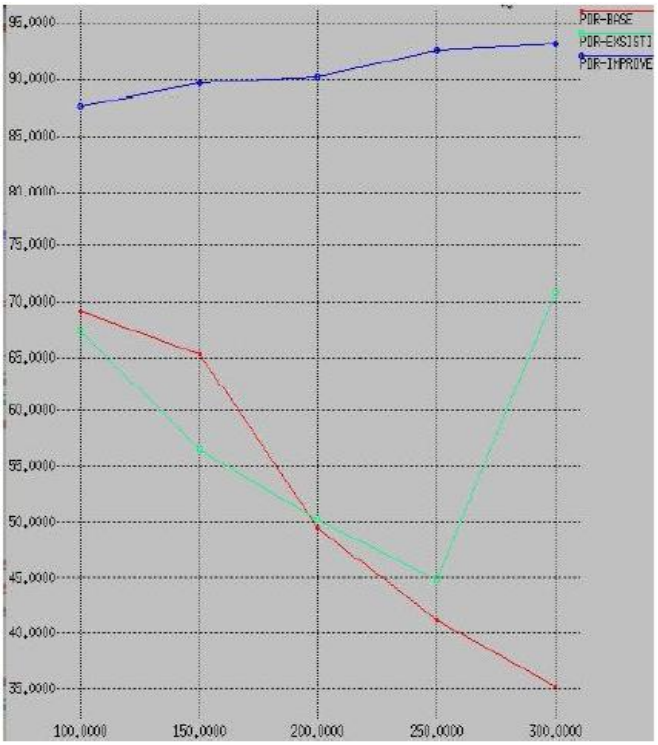


Fig: Packet Delivery Ratio

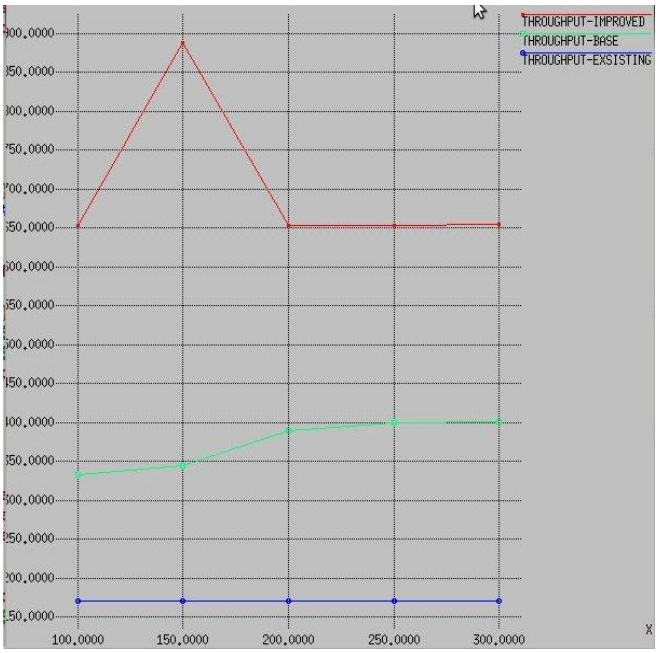


Fig: Throughput

CONCLUSION:

In my work briefly describes about the routing protocols for VANETS. It includes detailed discussion of GPSR and I- GPSR which are the most widely used protocols that perform better than the rest of protocols. These are compared with our proposed routing protocol I-GSPR which takes the benefit of GSPR. I-GSPR improves the PDR, Throughput, Delay as compared to GSPR because I-GSPR selects the node on basis of trust value and trust value for any node becomes low if that node drops packets. If we have two equidistant nodes form source and destination, then we select the node with higher trust value to forward the packet. This approach results in reducing the total number of packets dropped and hence will result in increased packet delivery ratio of the network.

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