An Efficient Vehicle-to-Vehicle communication protocol to avoid the congestion in VANETs.

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ABSTRACT- An inter vehicle communication (IVC) system can possibly expand the safety, proficiency and comfort of ordinary street go in VANETs. In this paper we proposed a productive Vehicle-to-Vehicle(V2V) correspondence protocol for avoid the crashes in VANETs. This convention decreases the quantity of street accidents by giving early notices messages and it additionally lessens the idleness in conveying crisis notices messages in different street circumstances in VANETs. In this project 2 mechanisms or algorithms have been simulated for VANET network for various densities of vehicles and each algorithm has its own way of establishing the path and sending the packets. Previous Ev2V finds the GPS vehicles pick the vehicle which's sends reply first and has the lowest channel noise like this it repeats until destination is reached. In Proposed EV2V algorithm the forward node is chosen based on the border nodes. The vehicle which REPLY's first will be chosen as the next forward node.

Keywords: collision avoidance ,protocols ,inter vehicle communication, vehicle to vehicle communication, VANETs.

1. INTRODUCTION

A. Ad-hoc Network

Ad-hoc network is a network formed without any central administration which consists of mobile nodes that use a wireless interface to send packet data. Nodes of the network are considered as routes and hosts. In traditional wired or wireless networks, the nodes of an ad hoc network could be expected to be mobile. Therefore the environment is considered as dynamic environment, since nodes might suddenly disappear from, or show up in, the network.

B. Vehicular ad-hoc Network

VANET is a form of application oriented network that provide communication vehicle to vehicle and vehicle to roadside wireless communication. VANET is a technology that uses moving vehicles as nodes in a network to create a mobile network. VANETs are the subgroup of MANETs. Vehicular Ad-hoc Network (VANET) represents a challenging class of mobile ad-hoc networks that enables vehicles to intelligently communicate with each other and with roadside infrastructure. The performance of VANETs depends heavily on the mobility model, routing protocol, vehicular density, driving environment and many other factors. As the vehicles are growing, the possibility of accidents has also increased. It is required to make our vehicles a bit intelligent so that we can reduce the possibilities of accidents. A vehicular ad-hoc network (VANET) adds ability in the vehicles. VANET poses number of challenges in terms of Quality of Service (QoS) and its performance. Quality of Service depends on numerous parameters such as bandwidth, packet delivery ratio, data latency, delay variance etc The quality-of-service (QoS) parameter in vehicular ad-hoc network is difficult because the network topology changes with high mobility and the available state information for routing is inherently imprecise. The main objective of VANET is to provide safety to vehicles. Vehicular communication systems are a type of network in which vehicles and roadside units are the communicating nodes, providing each other with information, such as safety warnings and traffic information. As a cooperative approach, vehicular communication systems can be more effective in avoiding accidents and traffic congestions than if each vehicle tries to solve these problems individually.

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Vehicular ad hoc networks (VANETs) can provide scalable and cost-effective solutions for applications such as traffic safety, dynamic route planning, and context-aware advertisement using short-range wireless communication. To function properly, these applications require efficient routing protocols. However, existing mobile ad hoc network routing and forwarding approaches have limited performance in VANETs. This dissertation shows that routing protocols which account for VANET-specific characteristics in their designs, such as high density and constrained mobility, can provide good performance for a large spectrum of applications

2.RELATED WORK

Xue Yang et al.[1], proposed a "Vehicle-to-Vehicle Communication Protocol" for Vehicle-to Vehicle(V2V) and Vehicle-to-Roadside(V2R)communications which is an effective protocol, comprising congestion control policies, service differentiation mechanisms and methods for emergency warning dissemination. Simulation results demonstrate that the proposed protocol achieves low latency, efficient bandwidth usage in stressful road scenarios and also reduce the number of fatal roadway accidents in VANETs. safety applications over VANETs based on the emerging dedicated short range communications (DSRC) protocol. They have investigated the performance of collision avoidance applications in VANETs on top of DSRC.

Thomas D.C.Little et al.[2], proposed a" new algorithm and protocol or an information propagation scheme" to enable data propagation of messages in VANETs without the use of fixed infrastructure. A goal in vehicular ad hoc networks (VANETs) is to enable the dissemination of traffic and road conditions such as local congestion and surface ice as detected by independently moving vehicles. This activity known as information warning functions is useful for vehicles on the highway and enables early reaction. This problem can be described as the directional propagation of information originating from linearly-distributed mobile nodes on a rectilinear plane.

Subir Bioswas et al.[3],proposed a"Vehicle-to-Vehicle(V2V) Communication Protocols for Highway Traffic Safety" which gives highway cooperative collision avoidance(CCA) for vehicular safety application using the dedicated short range communication (DSRC) protocol. They have described the DSRC architecture and implementation requirements in the context of a vehicle-to-vehicle wireless network.

Jing Zhao et al.[4], author proposed a several" vehicle-assisted data delivery (VADD) "protocols to forward the packet to the best road with the lowest data-delivery delay. Experimental results show that the proposed VADD protocols outperform existing solutions in terms of packet-delivery ratio, data packet delay, and protocol overhead. Multihop data delivery through vehicular *ad hoc* networks is complicated by the fact that vehicular networks are highly mobile and frequently disconnected. To address this issue, we adopt the idea of carry and forward, where a moving vehicle carries a packet until a new vehicle moves into its vicinity and forwards the packet. Based on the existing traffic pattern, a vehicle can find the next road to forward the packet to reduce the delay.

Mihaill.sichitiu et al.[5], proposed a" inter-vehicle communication (IVC) systems" (i.e., systems not relying on roadside infrastructure) have the potential to radically improve the safety, efficiency, and comfort of everyday road travel. Their main advantage is that they bypass the need for expensive infrastructure; their major drawback is the comparatively complex networking protocols and the need for significant penetration before their applications can become effective. Inter-vehicle communication systems (IVCs) rely on direct communication between vehicles to satisfy the communication needs of a large class of applications IVC systems can be supplemented or, in some situations, replaced by roadside infrastructure, allowing for Internet access and several other applications.

Theodore L.willke et al.[6], proposed a" inter-vehicle communication (IVC) protocols" have the potential to increase the safety, efficiency, and convenience of transportation systems involving planes, trains, automobiles, and robots. The applications targeted include peer-to-peer networks for web surfing, coordinated braking, adaptive traffic control, vehicle formations, and many others. The diversity of the applications and their potential communication protocols has challenged a systematic literature survey. We apply a classification technique to IVC applications to provide a taxonomy for detailed study of their communication requirements.

Yaser p.Fallah et al.[7], Presented a "Cooperative vehicle safety systems (CVSSs)" rely on vehicular ad-hoc networks (VANETs) for the delivery of critical vehicle tracking information. The wireless channel in such systems is shared by vehicles within the transmission range of each other. Due to the near-

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linear spatial distribution of vehicles in a highway scenario, the vehicular broadcast network is heavily affected by the hidden node interference phenomenon, which considerably limits its capacity. The performance of vehicle tracking application that is the basis for CVSS is therefore significantly affected by the performance of the underlying network. The two main parameters that affect the network condition and performance are the range and rate (frequency) of transmission of safety and tracking messages. In this paper, we analyze the effect of different choices of rate and range and present models that quantify network performance in terms of its ability to disseminate tracking information.

Seh Chun Ng et al.[8], an "analytical model" is developed with a generic radio channel model to fully characterize the access probability and connectivity probability performance in a vehicular relay network considering both one-hop (direct access) and two-hop (via a relay) communications between a vehicle and the infrastructure. Specifically, we derive close-form equations for calculating these two probabilities. Our analytical results, validated by simulations, reveal the tradeoffs between key system parameters, such as inter-BS distance, vehicle density, transmission ranges of a BS and a vehicle, and their collective impact on access probability and connectivity probability under different communication channel models. These results and new knowledge about vehicular relay networks will enable network designers and operators to effectively improve network planning.

Bin Hu et al.[9], author describes "A joint vehicle-vehicle/vehicle-roadside communication protocol" is proposed for cooperative collision avoiding in vehicular adHoc networks (VANETs). In this protocol, emergency warning messages are simultaneously transmitted via vehicle-to-vehicle (V2V) and vehicle-to-roadside (V2R) communications in order to achieve multipath diversity routing. In addition, to further improve communication reliability and achieve low latency, a multi-channel (MC) technique based on two non overlapping channels for vehicle-to-vehicle (V2V) and vehicle-to-roadside (V2R) is proposed. The simulation results demonstrate that the proposed joint vehicle-to-vehicle/vehicle-to-roadside(V2V/V2R) communication protocol is capable of improving the message delivery ratio and obtaining low latency, which are very important merits for highway traffic safety.

3.PROPOSED MODEL

EV2V Routing Algorithm: The EV2V Routing Algorithm is used to find the route from the source vehicle to destination vehicle.

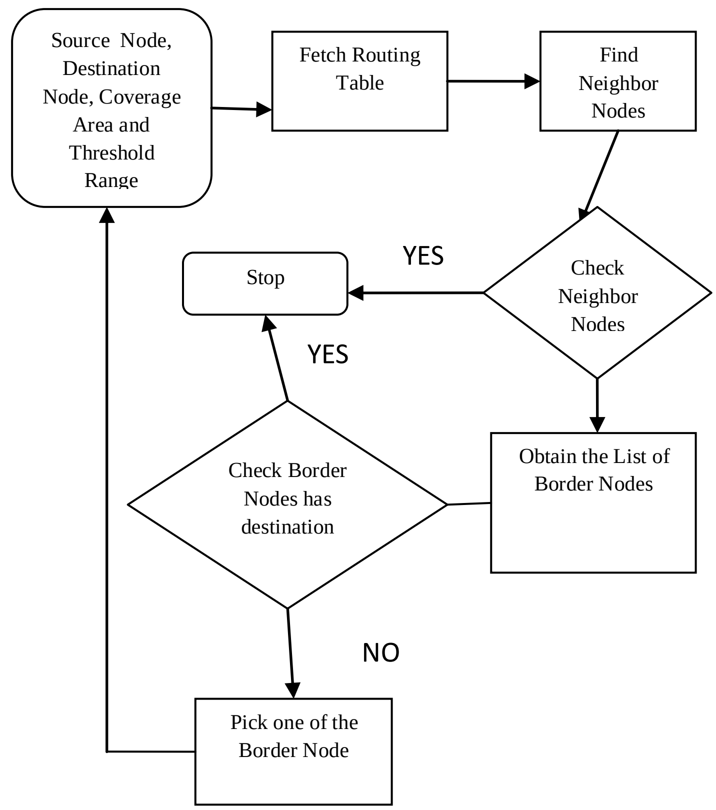

Fig 3.1: flow diadram of proposed model

Fig shows the flowchart for the EV2V Algorithm. As shown the fig the input is source vehicle, destination vehicle, coverage area and Threshold Range are the inputs.

1. The Routing table for the source vehicle is retrieved.

2. The set of vehicles are found which have the distance within the coverage area are called In vehicles or IN Vehicles.

3. If the In vehicle vehicles have the destination vehicle then route discovered is stopped.

4. If the In Vehicle vehicles does not have destination vehicle then go to step5.

5. The set of vehicles are found which have the distance between coverage area and the

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threshold are called border vehicles or border vehicle.

6. If the border vehicles have the destination vehicle then route discovered is stopped.

7. If the border vehicles does not have the destination vehicle then next forward vehicle is picked as one amoung border Vehicle.

The process is repeated until the destination vehicle is reached.

4. SIMULATION RESULTS

In simulation result we are comparing the previous effective vehicle to vehicle communication protocol with the current effective vehicle to vehicle communication protocol by using the different parameters.

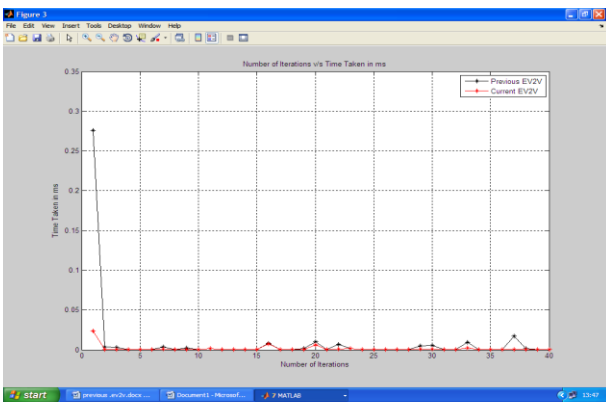

Figure shows the comparison of the previous effective vehicle to vehicle communication protocol with the current effective vehicle to vehicle communication protocol for vanets by using the parameter with respect to the time.

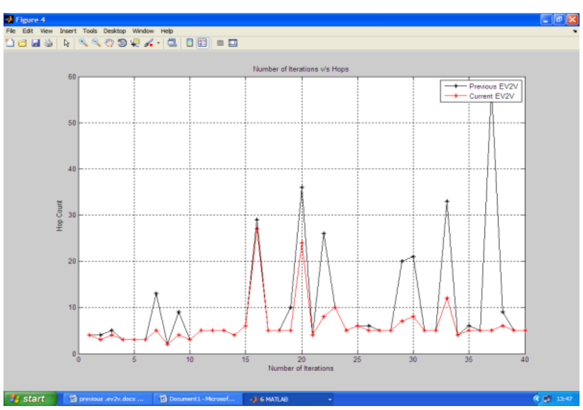

Figure shows the comparison of the previous effective vehicle to vehicle communication protocol with the current effective vehicle to vehicle communication protocol for vanets by using the parameter with respect to the hop count.

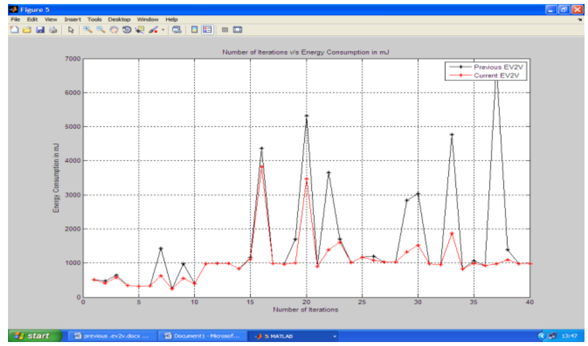

Figure shows the comparison of the previous effective vehicle to vehicle communication protocol with the current effective vehicle to vehicle communication protocol for vanets by using the parameter with respect to the energy consumption.

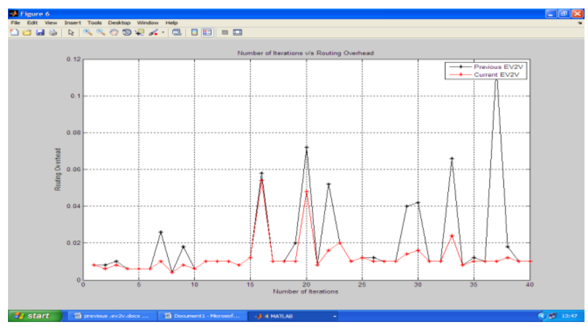

Figure shows the comparison of the previous effective vehicle to vehicle communication protocol with the current effective vehicle to vehicle communication protocol for vanets by using the parameter with respect to the routing overhead.

5.CONCLUSION

The proposed Vehicle-to-Vehicle(V2V) communication protocol for avoid the collision is to improve the road safety, congestion control policies and low emergency warning message delivery delay for increasing the number of vehicles travelling and reducing the number of accidents in VANETs. In this project 2 mechanisms or algorithms have been simulated for VANET network for various densities of vehicles and each algorithm has its own way of establishing the path and sending the packets. Previous Ev2V finds the GPS vehicles pick the vehicle which's sends reply first and has the lowest channel noise like this it repeats until destination is reached. In Proposed EV2V algorithm the forward node is chosen based on the border nodes. The

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