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Improving Driving Efficiency of Vehicular Ad-hoc Network Using Aodv Routing Protocols.

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Abstract

The network technology to form a communication network by the use of cars as mobile nodes is termed as Vehicular Ad-hoc Network(VANET).Routing protocols plays a very important and significant role in VANET, as they helps to determine the Performance of all the packets those are send and receive between the mobile nodes. This paper consults about the performance of Ad-hoc On-Demand (AODV) and Destination-Sequenced Distance Vector routing protocols over Constant Bit Rate traffic data type. This action will take place by using different speeds of nodes and number of nodes. The purpose of this above researched is to examine the best routing protocol which will further be used to secure the network. In accordance to our validated results, the protocol AODV performs the best off all evaluated protocols.

Keywords: VANET;MANET; IVC; WIMAX;

1. Introduction

There are several kinds of network; those are infrastructure-less, where the vehicles use to act like node. Such transportation , where vehicles do move across the traffic lanes or road along the traffic lanes which are already defined. The main examples for defining a infrastructure less network are Vehicular Ad-hoc Networks(VANET) and Mobile Ad-hoc Networks(MANET).In both the networks, there is no need of any fixed or existing infrastructures. This is so because both the networks have their nodes which are in motion with their self-organized characteristics. Therefore, they can be deployed anywhere where there is need. In general context, the main aim of VANETs as well as MANETs is to serve the security. The VANET is a new technology used now a days. This technology helps its driver to be connected with another one so as to achieve a successful communication among themselves . This is so because it Vehicular Ad-hoc Network supports many applications suitable for its driver for better communication. Vehicle-to-vehicle communications and inter-Vehicle Communications (IVC) are the two efficient types of communications in Vehicular Ad-hoc Network.

The vehicles in the VANET make a dynamic network as they uses wireless devices while they travel. The vehicles used in the VANET are known as network nodes .In which, some vehicles are denoted as sender and some as receivers. The information is transmit among these nodes. In the connective range, the speed of vehicles plays a very important key role. Thus upto 1000 meters the VANETs are implemented. There are many examples where VAANETs are widely used. There are traffic management agencies ,GPS navigation system along with toll tax and traffic messages, highway safety agencies, emergency services and law enforcement.

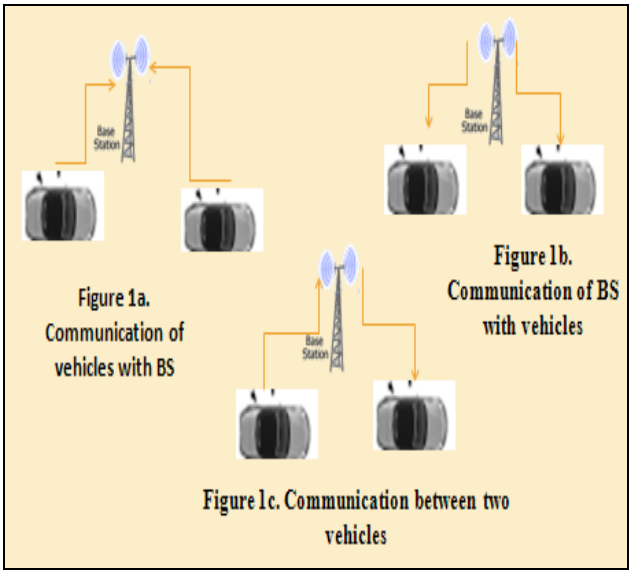

Fig.1a Inter-vehicles communications

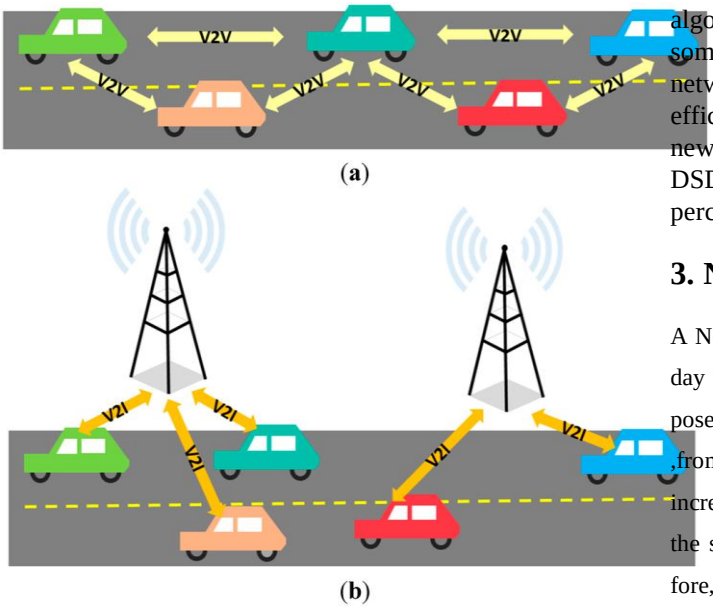

Fig.1 b VANET infrastructure

2. Routing Protocols

2.1. Ad-hoc On Demand Routing Protocol

It is the combination of DSDV routing protocol with DSR routing protocol. In AODV routing protocol both route search and route maintenance from DSR are done. This is called as reactive on-demand protocol. This is because AODV starts its discovery only if there is any sort of packet need to be sent. Thus, with lower-hop counts the AODV reduces the routing overhead. As all the routes are not maintained at a time. Only those routes from where the transfer of any packet takes places are maintained which reduces the overhead problem in the routes.

2.2. Dynamic Source Routing Protocol

Dynamic source routing protocol or we can say DSR only routes the packets from the source node to the destination. It does not keeps the record of the respective nodes. Neither it need any infrastructure in order to send the data in packets nor it uses any sort of announcements which further low downs the routing overhead of any wireless network.

2.3. Destination Sequenced Routing Protocol

DSDV or Destination Sequenced Distance Vector Routing Protocol provides and maintains a routing table for each node. These nodes forwards the routing table to their respective neighbor node. This function of routing algorithm takes place periodically. This results sometimes in increase of overhead problem over the networks. But however DSDV protocol is very efficient protocol for all the routing discovery whenever new destination is required by the routing. since the DSDV guarantees loop-free path thus low downs the percentage of routing latency discovery.

*Special description of the title. (dispensable)

3. Network Environment

A Network Environment is generated so as to avoid the day to day traffic scenario. Lets elaborate this with an example. Suppose there is a road junction, where there is a moderate traffic ,from where a VIP is going to pass. In such cases traffic will increase at places due to the priority factor. Hence in such case the safety purposes will be the major task to be done. Therefore, by applying the Random Waypoint mobility model over VANET will be the best option as it is a very renounced network architectures. The sending and receiving data with less noise and high quality will be the major focus for many further studies.

In this work we are going to use AODV protocol for city environments network with different mobility patters also after designing this network we are going to analyze the result of all the protocol. The coverage area of our network will be about 50 Km with one base station and 50 vehicles of different speed.

TABLE I: SIMULATION PARAMETERS

Parameters	Quantity
No. of vehicles	50
Transmission range	10KM
Channel	Wireless
Antenna	Omnidirectional
Area	500*500
Propagation model	Two ray ground
Speed (kmph)	10,20,30,40,50,60
Packet size	1000Byte
Routing protocol	AODV
Traffic Type	UDP/CBR
MAC	802.16e

4. Related Work

The effects of different packet size with the implementation of AODV routing protocols in homogeneous and heterogeneous MANET focuses the key technology for

the transmission of packets throughout the network from one to all nodes in broadcast way using MIMO technology .Also many researches shows survey of simple uplink scheduling algorithms for Wimax & carried out a simulation study of BE scheduling service on the uplink. The simulation is carried out using the NS2 simulator with the NIST implementation ver2.6 of Wimax module . An event-driven architecture (EDA) as a novel mechanism to get insight into VANET messages to detect different levels of traffic jams; furthermore, it also takes into account environmental data that come from external data sources, such as weather conditions. The VANET can be implemented using different routing protocol such as AODV, DSDV, DSR etc for the different mobility pattern for different environments and the performance analysis shows the comparative parameters with effective use of protocol for improvement of QoS. An improved version of AODV called Multipath Energy Aware AODV routing (ME-AODV), which utilizes the topology of network to divide it into one or more logical clusters and restricts the flooding of route request outside the cluster. Avoid combining SI and CGS units, such as current in amperes and magnetic field in oversteps.
In our work we are designing city environment VANET network with Wimax for different routing protocols as well as for different mobility patterns for up to 50 Vehicles with single base station.

Simulation Result

Table 2: Simulation Result

locotoP	vdoA
tuphguorhT	3.28spbM
RDP	95.75%
RLP	4.24%
yaleD	2.33sM

Delay Graph

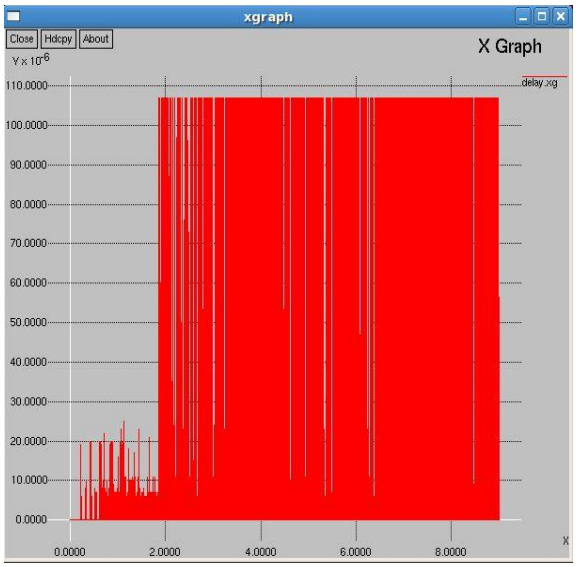

Fig no.1 Delay Graph

Nam file Generation

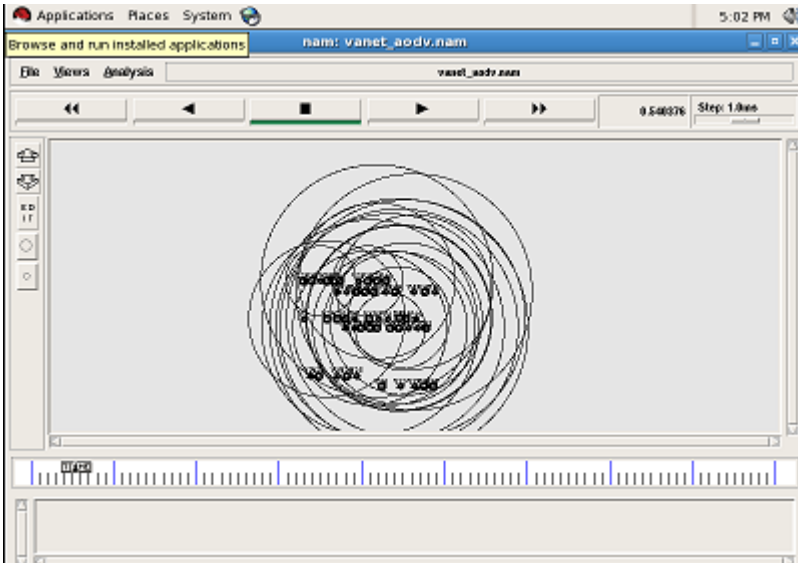

Fig no.2 Nam result

Trace File

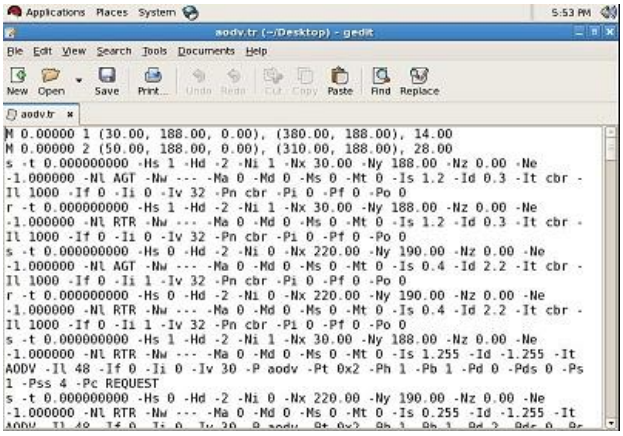

Fig no. 3 Trace File

Conclusion

In this work actual vehicular simulation model for city environment has been mentioned. More number of vehicle can involves to get high quality of service with improve in driving efficiency for secure communication also for many applications such as road safety, traffic control etc. Also in future there is an ample scope for designing different environment network to check its performance with existing VANET network.

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