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A Surveryon Applications And Characteristics ofVanet With System Architecture

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ABSTRACT

VANET (Vehicular Ad-hoc Network) is the king of special adhoc network. Now a day's road safety is very important because of the unexpected road accident, for this purpose VANET is very useful to improve road safety. VANET instruct with the wireless message between vehicles and vehicle to road side equipments. The main objective of VANET is to help a group of vehicles to maintain a communication network without using central base station. one of the main importance of this application where there is no infrastructure while critical to pass on the information for saving human lives. VANET is in the critical medical emergency situation of VANET spread the details about the road conditions as identified by moving vehicles. It can used to convey the message from source to destination vehicle and it is used to improve the quality of driving in terms of distance, time, and safety. This paper mainly aims to provide good security and privacy by the use of VANET.

KEYWORD:VANET, Road side unit, Peer to Peer, collision, Adhoc network.

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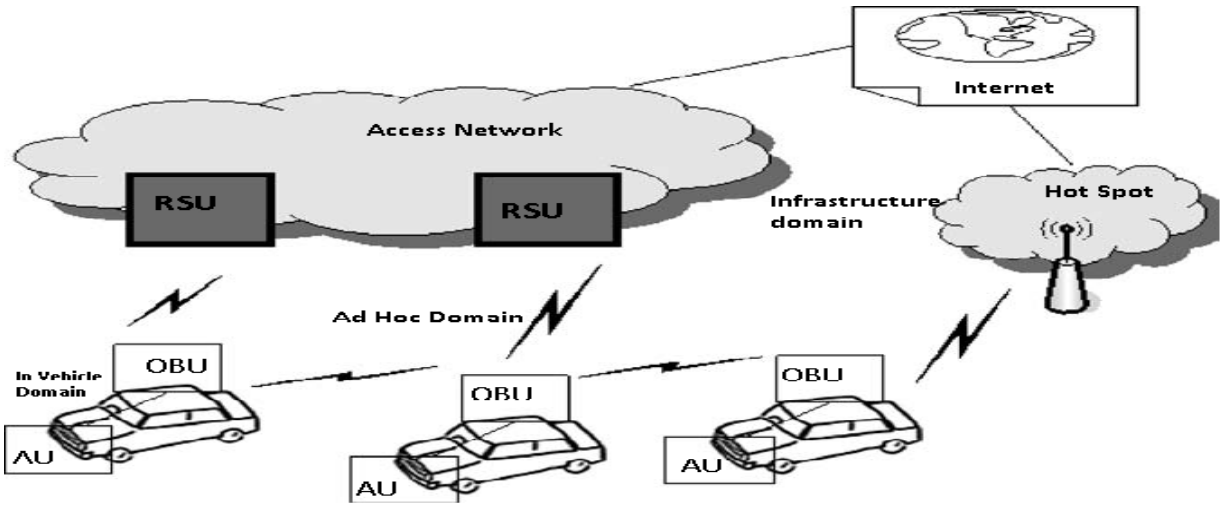
1. INTRODUCTION

VANET is very popular technologies for road safety.There are many research projects around the world based on VANET. Vehicles are equipped with high technology devices such as GPS, radar etc[1]. These wireless enables devices make vehicles intelligent and able to communicate with one to another. One of the major applications of VANET is in the critical medical emergency situations where there is no infrastructure while it is critical to pass the information for saving human lives[3]. Every vehicle becomes part of the network and also manages and control the communication on this network along with own communication requirements.

VANET is an application of mobile adhoc network. VANET is self organized network; it can be formed by connecting vehicle aiming to improve driving safety and traffic management with internet access by drivers. There are two types of communication are provided in the VANET[5]. First is a wireless adhoc network where vehicle to vehicle without any support of infrastructure. Second is communication between Road Side Units(RSU). Every node in VANET is equipped with two types of unit i.e On Board Unit(OBU) and Application Unit(AU)[3]. OBU has the communication capability whereas AU executes the program making OBU's communication capability. RSU can be attached to the internet[7].



VANET Security and Challenges

IEEE 802.11 provides short range communication with low latency. Here, NOW(Network on Wheels) which is associated with car-to-car consortium, has developed some protocols. Motors are created a Crash Avoidance Metric Partnership(CAMP) to improve the VANET services[2]. The ultimate goal of VANET is to provide road safety information among the nodes hence the frequent exchange of data on the network signify the role of security. The security of the information in

VANET is very crucial. In this article we are going to discuss the security challenges and major attacks on VANET and also the solution for these attacks[3].

2. VANET APPLICATIONS AND CHARACTERISTICS

VANET can play the major role can be categorized into two board categoriesSafety related application and user based application category.

2.1 Safety Related Application Category

These types of application are used to increase the road side safety.

Collision Avoidance

In survey 60% of accidents can be avoided if drivers were provided a warning before collision[4]. If drivers get a warning message on time the collision may be avoided[7].

Cooperative Driving

Drivers can get signals for traffic related warnings like speed warning, curve warning, Lane warning etc. These signals are used to the drivers for an uninterrupted and safe driving.

Traffic optimization

Traffic can optimized by the use of sending signals to the driver like traffic jam, accidents etc. so that they can choose their alternative path to reach the destination[4].

2.2 USER BASED APPLICATION

A VANET can provide services for the user apart from safety.

Internet Connectivity

People always want to connect with the internet hence VANET provides the constant connectivity of the internet to users.

Peer to peer application

This peer to peer application is used to provide services like sharing music, videos, movies etc. among the vehicles in the network.

Other services

VANET can be utilized in other user based application like payment service to tax, To locate fuel station, Restaurant etc[2].

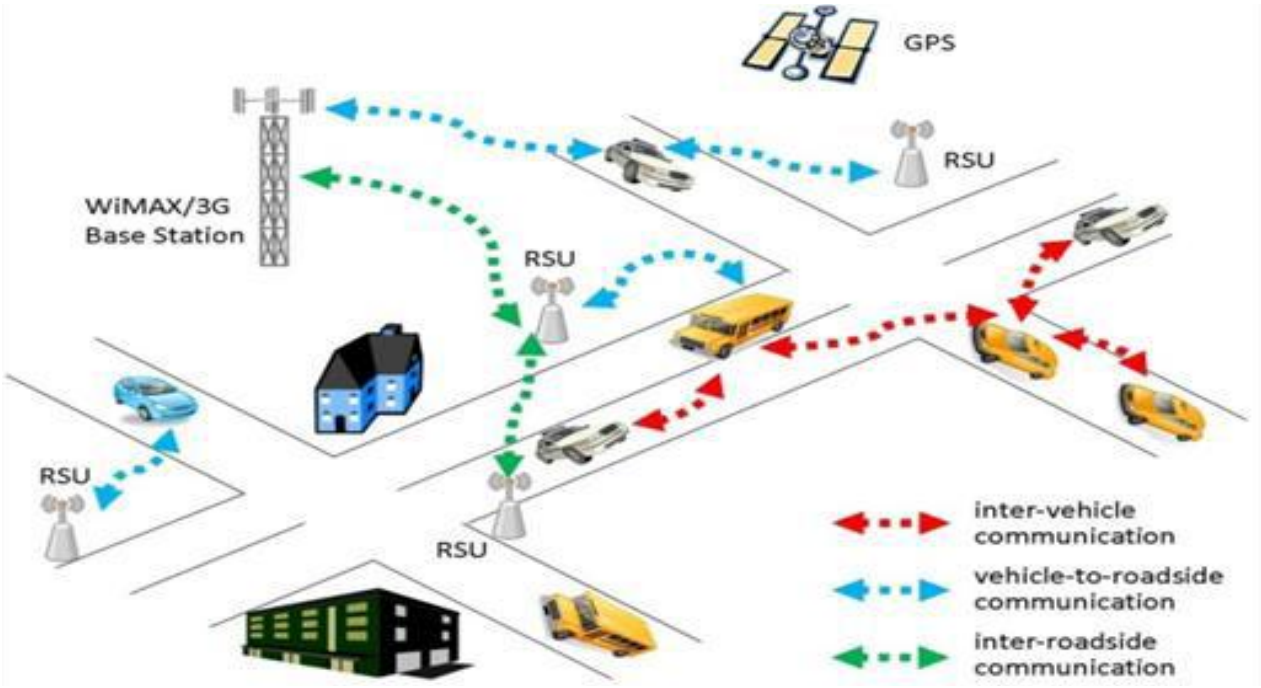
3. GENERAL ARCHITECTURE

The communication has three types

1. Inter vehicle communication(Vehicle to vehicle communication)
2. Vehicle to roadside communication(Communication between Road Side Unit)

3. Inter roadside communication(Communication between Roadside unit and the base station)

General Architecture

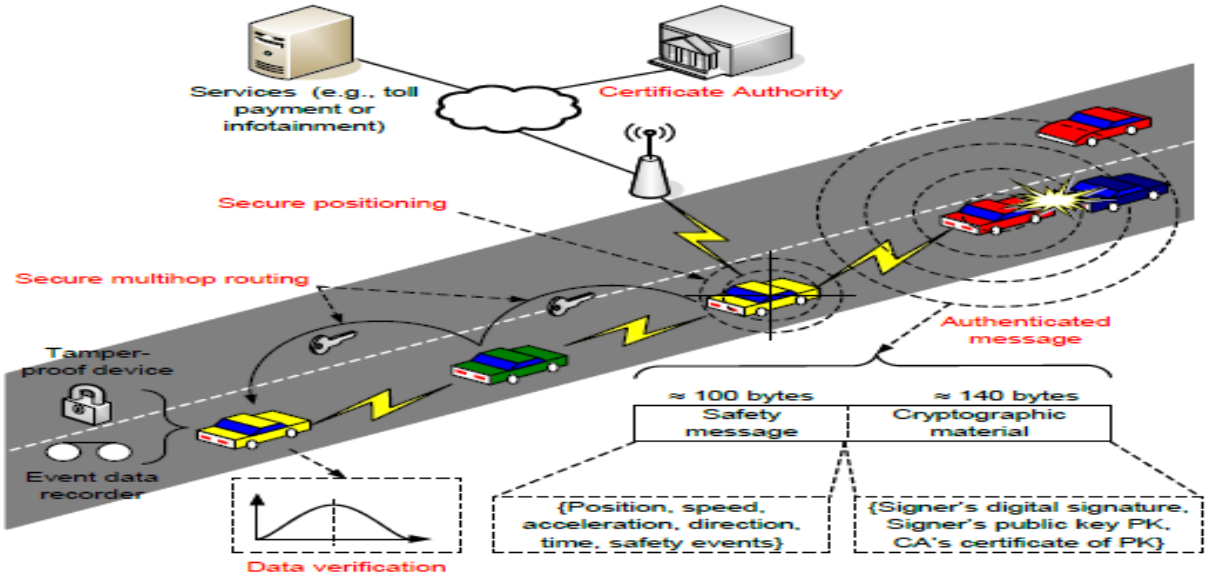


Application based on vehicular communication range from simple exchange of vehicle status to high complex, large scale traffic management. This section gives an overview on application categories for vehicular networks[7]. Although some operation details are not yet standardized for most of the applications. Such a collection never be completely finished the delivers basic mechanisms, components and constraints involved in the systems[5].

4. SYSTEM ARCHITECTURE

Security and Privacy are two critical concerns for VANET designers. A number of attacks could easily be conducted, namely, identity theft, message content modification, false information generation etc.

A vehicle could report a false emergency situation to obtain better driving conditions[3].



VANET works

If message integrity is not guaranteed a vehicle could modify the content of message, that message is sent by another vehicle to affect the behavior of the other vehicles[6].

5.VANET CHARACTERISTICS

VANET is an application of MANET but it has its own distinct characteristics.

High mobility:

The node in VANET usually moving at high speed. It makes harder to predict a node's position and make protection of node privacy.

Unbounded network size:

VANET implemented for one city, several cities or for countries. It means that network size in VANET is geographically unbounded.

Rapidly changing network topology:

The high node mobility and random speed of vehicles, the position of node changes frequently.

Frequent exchange of information:

The adhoc nature of VANET motivate to combine the information from the other vehicles and road side units. Hence the information exchange among node becomes frequent[6].

Wireless communication:

VANET designed for the wireless environment. Here, node connected and exchange their information. Some security measure must be considered in communication[5].

Sufficient energy:

VANET nodes have no issue of energy. This allows VANET usage on demanding technique and also provides unlimited transmission power.

Better Physical Protection:

VANET nodes are more difficult to compromise physically and reduce the effect of infrastructure attack[7].

6. TECHNICAL CHALLENGES IN VANET

Technical challenges deals with the technical obstacles

Network Management:

The Network Topology and channel condition change rapidly due to high mobility.

Security:

VANET Provides the road safety application which are critical therefore security of messages must be satisfied.

Environmental impact:

VANET use the electromagnetic waves for communication. These waves are affected by environment[1].

7. CONCLUSION

Security is the major issue to implement in the VANET. In this article the architecture and the challenges of VANET are also discussed. VANET is going to turn out to the networking platform that would support the future vehicular application. Some of the technologies are used in the different solution. All requirement authentication and privacy are the major issues in VANET. Security and performance are being undertaken to make vanet reality. In future would like to propose an algorithm that would enhance the performance with full security using light weight mechanism.

8. REFERENCES

1. F.Sommer,&C.Dressler, “Progressing toward Realistic Mobility Models in VANET Simulations,” IEEE Communications Magazine 2008;1(2):132–137.
2. F. Li and W. Yu, “Routing in Vehicular Ad Hoc Networks: A Survey,” Vehicular Technology Magazine, IEEE,2007;2(2):12–22.
3. S. Wang and N. Yao, “LIAP: a local identity-based anonymous message authentication protocol in VANETs,” Computer Communications , 2017;1(2): 154–164.
4. B SmithaShekar et al., "GPS Based Shortest Path for Ambulances using VANETs," in 2012 International Conference on Wireless Networks (ICWN 2012), Singapore, 2012;8(6):190-196.

5. D. B. Johnson and D. A. Maltz, “Dynamic Source Routing in Ad Hoc Wireless Networks,” in Mobile Computing, 1996, ch. 5.
6. M. Zhang and R. S. Wolff, “A Border Node Based Routing Protocol for Partially Connected Vehicular Ad Hoc Networks,” Journal of Communications,Feb. 2010; 5(2):130–143.
7. C. Lochert, H. Hartenstein, J. Tian, H. Fussler, D. Hermann, and M. Mauve, “A routing strategy for vehicular ad hoc networks in city environments,” in Intelligent Vehicles Symposium, 2003. Proceedings. IEEE, 2003; 156–161.
8. A. Fonseca and T. Vazo, “Applicability of position-based routing for {VANET} in highways and urban environment,” Journal of Network and Computer Applications,2013; 36(3): 961–973.