



Analysis of Various Routing Protocols of VANETs

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ABSTRACT: *The vehicular adhoc network is the decentralized type of network in vehicle to vehicle and vehicle to road side units can communicate with each other. Due to such dynamic nature of the network routing, security and quality of the service are the major issues of VANETs. This paper is based on the analysis of routing techniques of VANETs. The routing techniques are analyzed in terms of description and outcomes.*

KEYWORDS: *VANETs, LAR, Routing Protocol*

1.1 INTRODUCTION

One of the main areas of research studies of communication among the vehicles and road-side units more specifically the vehicular ad-hoc network (VANETS). In this network all the vehicles and elements of roadside infrastructure connected with each other without requiring an underlying infrastructure, send and receive information and give warning about current traffic situation [5]. In today era used Wi-Fi IEEE 802.11 based technology it is very commonly used for deploying VANETs. All the vehicles connected with the wireless network interface it can be use either 802.11b or 802.11g are the two standards for access media. These standards are general purpose standards and they do not fit properly the requirements of high dynamic network such as VANETs. In this scenario currently describe the DSRC (Dedicated short-range communication) has been proposed as the communication standard for VANET it is used in those platform where short medium range communication service that offered at very low latency and high data rate. IEEE 802.11 standard implies that vehicles communicate with in limited range while moving [6]. These kinds of networks are very optimal configurations protocols in order to increase the effective data packet exchange, and reduce the transmission time and network usage [8].

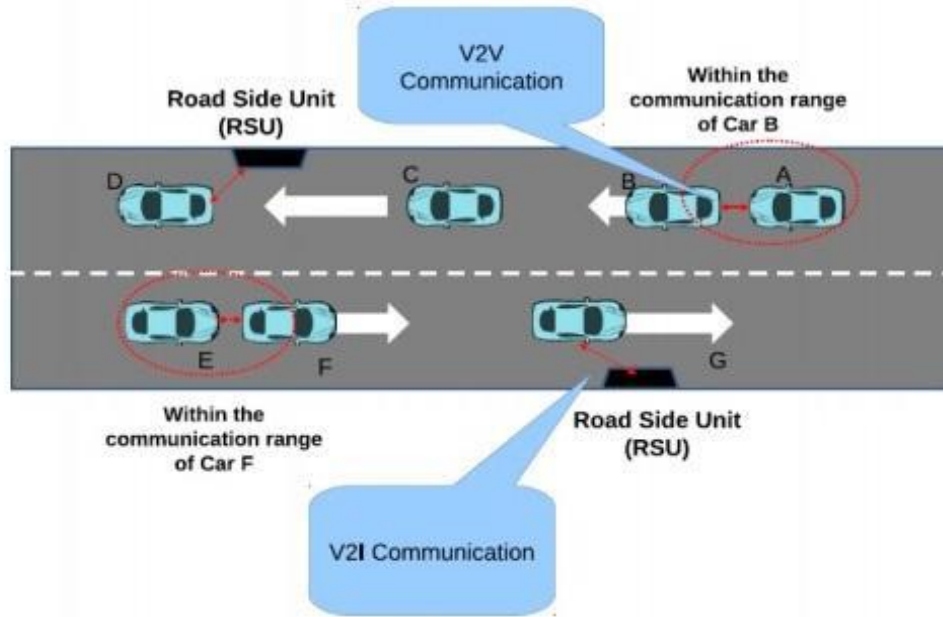


Fig VANET communication and infrastructure

1.2 V2V communication

In this communication deployment regarding the C2C-CC reference architecture together with the advance in heterogeneous communication technology between the vehicles. In the vehicular networks potentially have two types of communication scenarios: car to car communication and other is car to infrastructure scenario. There are so many hotspots along the road such hot spots can operate individually at home or office by the help of internet service provider or integrated operated. Vehicles can communicate with other vehicles directly without communication infrastructure; all the vehicles cooperate and forward information on the behalf of each other [9]. Combination of these deployment cases is also possible. In the future architecture for intelligent transportation system considers all the vehicles working as active nodes that are responsible for collecting and forwarding critical information. All the vehicles would be able to collect and process information by means of intelligent sensor and to exchange information with other nodes in global communication system. It can be categories into three parts:-

- In-vehicle communication
- Vehicle to road side/vehicle to infrastructure side communication
- Inter vehicle communication

1.2.1 In-vehicle communication: In-vehicle communication can be used to exchange the information between different components like vehicles. This system mostly used in modern vehicle that are present in today era. Mainly two application areas for in-vehicle communication it can be distinguished into two parts: in the vehicle network of sensor, actuator and controller and second is high rate multi-media communication for comfort applications for example passenger entertainment [8].

1.2.2 Vehicle to roadside communication: In vehicle to road side communication is also called a vehicle to infrastructure communication. In this time vehicles communicate from the vehicle to a fixed infrastructure. This communication in the two forms is unidirectional or bidirectional fixed infrastructure [10]. Broadcast system support the unidirectional transfer of information from broadcast station to the vehicle. In this system the entire vehicle communicates point to point with the base station or access point. Base station make a coordinating the communication by using the physical synchronization and medium access. Base station balances the excessive load

and provides the access control in proper channel. Bidirectional technologies further divide into the cellular mobile phone system and small range system. Existing cellular infrastructure like GSM and UTM and provide information required infrastructure always available. The small local area but can provide high data rates at a low cost. Depending on the type of air interface and infrastructure, the range in which VRC is possible varies from tens of meters for wireless local area technologies to hundreds of kilometres for public radio systems.

CHALLENGES IN VANET

I. SECURITY

Security in VANET should be considered as important as securing other networks in computing. There are a numbers of possible attacks in VANETs. The purpose of these attacks is to create problem for users to access the system or phishing some information [8]. In [9], authors have presented such a security method which encourages the nodes to provide a secure sender authentication. Due to the large number of independent network members (vehicles) and the existence of human factor, misbehaviour can take place. So an authentication trust needs to be established. In VANET security, the attack threats can be classified into different categories. In [10], authors have described three key types of attacks:

Bogus Information An inside attacker can make bogus information. This can cause disastrous situations (a threat to Authenticity).

ID Disclosure Location information in relation to vehicle's exact position (privacy) needs to be protected (a threat to Confidentiality).

Denial of Service

II. QUALITY OF SERVICE (QoS)

Provision of certain quality of service levels in VANET is an important task. QoS support over VANETs remains a challenge when current routing paths become no longer available as a result of changes in node velocity, node positioning, network topology or distance between vehicular nodes [11].

III. EFFICIENT ROUTING

This means that a mechanism is desired that can be used to assign unique addresses for vehicles, but these protocols do not guarantee to avoid duplicate allocation addresses in the network [12]

VANETs applications:

VANETs applications scenarios very huge learning and designing phase is very difficult may become a very nasty job. They are classified into in such a way such as set of protocol will work for applications from a given class. The benefits of classifying them as follow:

- Develop some applications models to represent a large number of applications with similar properties belonging to same class for application simulation and validations.
- Identification of key performance metrics relevant to each identified applications class, as benchmarks for evaluating whether designed application mechanism can meet common requirements mandated by application classes.

Review of Literature

S.NO	RESEARCHER	YEAR	PAPER NAME	OUTCOMES
1.	Rakesh Kumar and MayankDav	2011	A Comparative Study of Various Routing Protocols in VANET	This paper also explores the motivation behind the designed and traces the evolution of this routing protocol. At last this paper also show the tabular comparison with various routing protocols for VANET.
2.	MuddassarFaroq and Gianni A. Di Caro	2008	Routing Protocols for Next Generation Networks Inspired by Collective Behaviors of Insect Societies: An Overview	In this paper define the different classes of wired and wireless networks for each class discuss the characteristics of ant and bee colony inspired algorithm. In this paper also show the distinctive features and discuss the general pros and cons in relationship to the state of the art.
3.	Patil V.P	2012	Vanet Based Traffic Management System Development And Testing Using Aodv Routing Protocol	In this paper suggest more innovative approach to deal with this traffic congestion problem using the characteristics of vehicular ad-hoc networks (VANET). This system is developed and tested using the AODV protocol od ad-hoc mobile network to deal with the problem of vehicle traffic congestion in vehicular network.
4.	Aswathy M and Tripti	2012	A cluster based enhancement to AODV for inter-vehicular communication in VANET	This paper main aim to improving the performance of AODV by enhancing the existing protocol by creating stable clusters and performing routing by cluster head and gateway nodes.
5.	Jerome Haerri	2005	Performance Comparison of AODV and OLSR in VANETs Urban Environments under Realistic Mobility Patterns	In this paper also show the clustering effects created by cars aggregating at intersections have remarkable impacts on evaluation and performance metrics. Main objective is to provide a qualitative assessment of the applicability of protocols in different vehicular network
6.	Amiour med tahar, Bilami azeddine	2007	Vanet Based Traffic Management System Development And Testing Using Aodv Routing Protocol	This simulation shows the extended AODV using MPR reduces the load and performance better than the standard in case of AODVM using MPR reduces the load and perform better than the standard in case of traffic with low and high speeds
7.	Rakesh Kumar and MayankDav	2012	A Comparative Study of Various Routing Protocols in VANET	In this paper mainly define the VANET applications based on the various broadcasting data dissemination protocols are surveyed separately and their fundamental characteristics are revealed. At the end of this paper comparison of all the protocols

Conclusion

In this paper, it is concluded that vehicular adhoc network is the decentralized and self configuring type of network in which routing is the issue which reduce network efficiency. The routing protocols are broadly classified into reactive, proactive and hybrid type of protocols. In this paper, various reactive routing protocols are analyzed in terms of various parameters.

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