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Review on Routing Approaches of VANET with Opportunistic Network

Karan Sharma*, Shelly Bhalla

Student, Assistant Professor

Karansharma1376@gmail.com , shelly.rbu@gmail.com

Abstract— VANET (Vehicular Ad-hoc Network) is a new technology which has taken enormous attention in the recent years. Due to rapid topology changing and frequent disconnection makes it difficult to design an efficient routing protocol for routing data among vehicles, called V2V or vehicle to vehicle communication and vehicle to road side infrastructure, called V2I. It is autonomous & self-organizing wireless communication network, where nodes in VANET involve themselves as servers and/or clients for exchanging & sharing information.

Keywords— **Vanet, adhoc, wireless, network.**

I. INTRODUCTION

Recently, many works have provided in-depth studies of the VANET environment, including realistic mobility and propagation models. (VANETs) has grown over the last few years, particularly in the context of emerging intelligent transportation systems (ITS). However, efficient routing in VANETs remains challenging for many reasons, e.g., the varying vehicle density over time, the size of VANETs (hundreds or thousands of vehicles), and wireless channel fading due to high motion and natural obstructions in urban environments (e.g., buildings, trees, and other vehicles).

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Characteristics of VANET

VANET has some unique characteristics which make it different from MANET as well as challenging for designing VANET applications.

1. **High dynamic topology**: The topology of VANET changes because of the movement of vehicles at high speed. Suppose two vehicles are moving at the speed of 20m/sec and the radio range between them is 160 m. Then the link between the two vehicles will last 160/20 = 8 sec.

2. **Frequent disconnected network**: From the highly dynamic topology results we observe that
Frequent disconnection occurs between two vehicles when they are exchanging information. This disconnection will occur most in sparse network.

3. **Mobility modelling**: The mobility pattern of vehicles depends on traffic environment, roads structure, the speed of vehicles, driver's driving behavior and so on.

4. Battery power and storage capacity: In modern vehicles battery power and storage is unlimited. Thus it has enough computing power which is unavailable in MANET. It is helpful for effective communication & making routing decisions.

5. Communication environment: The communication environment between vehicles is different in sparse network & dense network. In dense network building, trees & other objects behave as obstacles and in sparse network like high-way this things are absent. So the routing approach of sparse & dense network will be different.

6. Interaction with onboard sensors: The current position & the movement of nodes can easily be sensed by onboard sensors like GPS device. It helps for effective communication & routing decisions.

ROUTING PROTOCOLS

The characteristic of highly dynamic topology makes the design of efficient routing protocols for VANET is challenging. The routing protocol of VANET can be classified into two categories such as Topology based routing protocols & Position based routing protocols.

1. Topology based routing protocols: Topology based routing protocols use link's information within the network to send the data packets from source to destination. Topology based routing approach can be further categorized into proactive (table-driven) and reactive (on-demand) routing.

2. Position based routing protocols: Geographic or Position based routing is a routing that each node knows it's own & neighbor node geographic position by position determining services like GPS. It doesn't maintain any routing table or exchange any link state information with neighbor nodes. Information from GPS device is used for routing decision.

Advantages of VANET

Public Safety ,Traffic Management, Traffic Coordination and Assistance, Traveler Information Support, Comfort, Air pollution emission measurement and reduction.

Disadvantages of VANET

Flooding in route discovery initial phase, Wasted band width, Delay, Increasing network congestion, External source for destination location, Bad performances for long distance between source and destination.

II. LITERATURE REVIEW

[1] **Mohammad Al-Rabayah et al**: In this paper, they propose a new hybrid location-based routing protocol that is particularly designed to address this issue. Our new protocol combines features of reactive routing with location-based geographic routing in a manner that efficiently uses all the location information available. The protocol is designed to gracefully exit to reactive routing as the location information degrades. They show through analysis and simulation that their protocol is scalable and has an optimal overhead, even in the presence of high location errors. Their protocol provides an enhanced yet pragmatic location-enabled solution that can be deployed in all VANET-type environments.

[2] Bijan Paul et al: In this paper the author presents the pros and cons of VANET routing protocols for inter vehicle communication. The existing routing protocols for VANET are not efficient to meet every traffic scenarios. Thus design of an efficient routing protocol has taken significant attention. So, it is very necessary to identify the pros and cons of routing protocols which can be used for further improvement or development of any new routing protocol. Due to rapid topology changing and frequent disconnection makes it difficult to design an efficient routing protocol for routing data among vehicles, called V2V.

[3] Mario De Felice et al: In this paper the authors introduces an application framework to handle multi-hop, multi-path, and dynamic environments and a routing protocol, the DBD (Distributed Beaconless Dissemination), that enhances the dissemination of live video flows on multimedia highway VANETs. DBD uses a backbone-based approach to create and maintain persistent and high quality routes during the video delivery in opportunistic Vehicle to Vehicle (V2V) scenarios. It also improves the performance of the IEEE 802.11p MAC layer, by solving the Spurious Forwarding (SF) problem, while increasing the packet delivery ratio and reducing the forwarding delay. Performance evaluation results show the benefits of DBD compared to existing works in forwarding videos over VANETs, where main objective and subjective Q opportunistic oE results are measured.

[4] Neha Garg, Puneet Rani: In this paper, they have improved the performance of Ad-hoc on Demand Distance Vector (AODV) routing protocol by using some parameters i.e. Active route time outs and hello interval to choose the best path for routing and compared the proposed AODV protocol performance with Normal AODV in terms of different performance metrics i.e. average throughput, average delay and average network load. They have used a simulation tool "OPNET Simulator v14.5" for performance evaluation. Results show that proposed AODV routing protocol has better performance as compared to normal AODV.

[5] K. Wang et al: In this paper the authors build redundant transmission trees, although the topology is highly dynamic. This proposal is difficult to implement in opportunistic and dynamic VANET environments: stability and availability of communication links over time are critical issues when dealing with real-time multimedia applications and they become much more challenging when coupled with vehicular mobility and frequent lane changes. Besides the overhead required for maintaining the overlay networks, the maximum bit rate considered is still somehow low for reactive routing as the location information degrades. They show through analysis and simulation that their protocol is scalable and has an optimal overhead, even in the presence of high location errors. Their protocol provides an enhanced yet pragmatic location-enabled solution that can be deployed in all VANET-type environments.

III. CONCLUSIONS

Besides the overhead required for maintaining the overlay networks, the maximum bit rate considered is still somehow low for reactive routing as the location information degrades. They show through analysis and simulation that their protocol is scalable and has an optimal overhead, even in the presence of high location errors. Their protocol provides an enhanced yet pragmatic location-enabled solution that can be deployed in all VANET-type environments

REFERENCES

1] Networks 11 (3) (2013) 818–832. **1]** Mohammad Al-Rabayah and Robert Malaney, 'A New Scalable Hybrid Routing Protocol for VANETs' VOL. 61, NO. 6, JULY 2012

[2] Bijan Paul, Md. Ibrahim, Md. Abu Naser Bikas, 'VANET Routing Protocols: Pros and Cons', Volume 20– No.3, April 2011

[3] Mario De Felice, Andrea Baiocchi, , Eduardo Cerqueira, Adalberto Melo, Mario Gerla, Francesca Cuomo, 'A distributed beaconless routing protocol for real-time video dissemination in multimedia VANETs' 2014

[4] Neha Garg, Puneet Rani, 'An improved AODV routing protocol for VANET (Vehicular Ad-hoc Network)', Volume 4, Issue 6, June 2015

[5] Y.-L. Hsieh, K. Wang, Dynamic overlay multicast for live multimedia streaming in urban VANETs, Comp. Networks 56 (16) (2012) 3609–3628.

[6] F. Naeimipoor, C. Rezende, A. Boukerche, Performance evaluation of video dissemination protocols over vehicular networks, in: IEEE 37th Conference on Local Computer Networks Workshops (LCN Workshops), 2012, 2012, pp. 694–701.

[7] C. Rezende, H.S. Ramos, R.W. Pazzi, A. Boukerche, A.C. Frery, A.A. Loureiro, Virtus: a resilient location-aware video unicast scheme for vehicular networks, in: IEEE International Conference Communications (ICC), 2012, 2012, pp. 698–702.

[8] M. Di Felice, L. Bedogni, L. Bononi, Group communication on highways: an evaluation study of geocast protocols and applications, Ad Hoc

