Global Journals LaTeX JournalKaleidoscope™
Artificial Intelligence formulated this projection for compatibility purposes from the original article published at Global Journals. However, this technology is currently in beta. *Therefore, kindly ignore odd layouts, missed formulae, text, tables, or figures.*

A Survey on Topology based Reactive Routing Protocols in Vanets

Dr. N.M Saravana Kumar

Received: 16 December 2017 Accepted: 2 January 2018 Published: 15 January 2018

Abstract

VANETS comes under the shadow of MANETS. It provides a prominent approach to the intelligent transport system. In this paper, we have explained the different number of topology-based reactive routing protocols for the smart transport system. Vanets provides many applications with its infrastructure less topology like traffic information, vehicle safety etc. Designing a new and efficient routing protocol for all the applications of vanets is very difficult so we have compared all the protocols with a detailed analysis so that we may find the best among them after that we may improve the routing process by considering the different types of parameters. At first, we will discuss about the basics of vanets and its characteristics later we will discuss the categories of routing protocols and their comparative analysis.

Index terms— routing, topology-based routing protocols, vanets, vehicle safety.

1 I. Introduction

ehicular Ad-Hoc Networks (VANET) are a particular kind of Mobile Ad Hoc Network, (MANET), in which vehicles act as nodes and each vehicle is equipped with transmission capabilities which are interconnected to form a network. The main intention of delve into VANETs is the enhancing the vehicle safety using inter-vehicular communication (IVC). VANETs have several different aspects compared to MANETs, in that the nodes move with high velocity because of which the topology changes rapidly. VANETs pretence many challenges on expertise, protocols, and refuge, which increase the need for research in this field.

The communication in these types of networks are in between vehicles to roads and vehicles to vehicles and inters road communication is used for improving the safety and to reach the goals of vanets. The following figure gives the idea of communication in vanets.

2 a) Types Communication in VANETS

Fascinatingly the applications of WSNs were emerged drastically, Such as accessing internet through vehicles; sharing of information among vehicles, traffic information etc. So efficient routing protocol should be used to avoid delay, packet drops and reduce frequent link breaks. Now a day's vehicles on roads are heavily increased, due to the vibrant nature of VANETs links between two vehicles would remain for a short time due to this communication would get delay which decreases network performance. Existing approaches used E-TX, link expiration time, rate estimations and flooding methods for establishing a reliable route between source and destination. But considering only expiration time and rate factors could not yield better results because if a node with high expiration time with minimum stability will not establish a proper communication.

3 Fig. 1: Architecture of VANET

The following are the different characteristics of VANETs which are similar to MANETs [3], but there are some specific kinds which can be categorized as follows:

(1) Highly dynamic topology (2) Frequent disconnected network (3) Mobility modeling and Prediction (4) Communication Environment (5) Hard delay constraints (6) Interaction with onboard sensors, (7) Unlimited Battery Power and Storage

4 II. Overview of Routing Protocols in Vanets

Routing is the process of transmitting the data among the nodes from one place to another here from one vehicle to another vehicle. Routing occurs at Layer 3 (network layer) of the OSI model. In VANET, The routing protocols are broadly categorized into many types [4]. Depending upon the topology, transmission strategies, position, delay tolerant, Cluster-based, Geo cast, Multicast etc. We have a vast number of routing protocols in VANETS. In this paper, we will discuss topology-based reactive routing protocols under VANETS. It comes under the category of Routing Information based Routing. Under that we have two types they are Topology based and Position based techniques.

5 Fig. 2: Categories of Routing Algorithms

6 III. Topology-based Routing Protocols

These types of routing protocols use the link information that exists in the set of connections (network) to perform packet forwarding. They discover the route and retain it in a Routing table before the sender starts transmitting data. They are additional at odds into reactive, proactive and hybrid protocols. These steering Protocols are standards and used for transfer the data in the Networks. Efficient Routing protocols make dynamic routing decisions in network. Topology Based Routing schemes generally require additional node topology information during the routing decision process.

7 Global Journal of Computer Science and Technology

Volume XVIII Issue IV Version I ? The benefit of proactive routing protocol is that there is no route detection since the destination route is stored in the backdrop, but the inconvenience of this protocol is that it provides low latency for realtime application. A routing table is constructed and maintained within a node. It also leads to the preservation of idle data paths, which causes the lessening in the available bandwidth. The proactive routing protocols care for the tables representing the topology. In these protocols the tables updating frequently and sends the information from one node to another. Proactive routing protocols also called the table driven protocols due to its nature. There are two types of updating available in proactive protocols periodic update and triggered update due to broadcast the update tables they waste power and bandwidth in the network [8].

8 b) Reactive routing protocols

Reactive routing opens a route only when it is necessary for a node to communicate with another node. It maintains only the routes that are currently in use, thereby reducing the burden on the network. Information Engineering and Applications in which the query packets are flooded into the network for the path search and this phase completes when route is found. These protocols are called as on-demand routing protocols as they periodically update the routing table, when Reactive routing consists of route discovery phase g Protocols for VANET, Journal of some data is there to send. The various types of reactive routing protocols are AODV, DSR and TORA.

9 i. Temporally ordered routing algorithm

The Temporally Ordered Routing Algorithm (TORA) is an algorithm for routing the data across the different types of Networks like Wireless Mesh Networks, Wireless Sensor Networks, Mobile Adhoc Networks and Vehicular Adhoc Networks etc. It attempts to achieve a high degree of scalability using a "flat", non-hierarchical routing algorithm.

TORA constructs and maintains a Directed Acyclic Graph (DAG) rooted at a destination with a principle of No two nodes may have the same height.

Here the information is transferred or flows from the nodes which are having the highest metrics to the nodes which are having the lowest metrics. So here the data transmission is only 'down-hill'. So, it achieves loop-free multipath routing, as the data cannot flow 'uphill' and so cross back on itself. It mainly operates on the following three basic functions. They are: 1. Route creation 2. Route maintenance 3. Route erasure At the time of the route creation and maintenance phases, the nodes use the height as a parameter to establish a directed acyclic graph (DAG) rooted at destination [1]. After that links are assigned based on the relative height metric of neighbouring nodes. During the changing of the nodes if the DAG is broken and the route maintenance unit comes into the picture to re-establish a DAG routed at the destination. Timing is the most important factor for TORA because the height metric is dependent on the logical time of the link failure. TORA's route erasure phase is essentially involving flooding a broadcast clear packet (CLR) throughout the network to erase invalid routes. The algorithm [1] The Dynamic Source Routing protocol (DSR) is a unproblematic and well-organized routing protocol intended specifically used for multi-hop wireless ad hoc networks of mobile nodes and also it was implemented for routing in vehicular networks too [5].

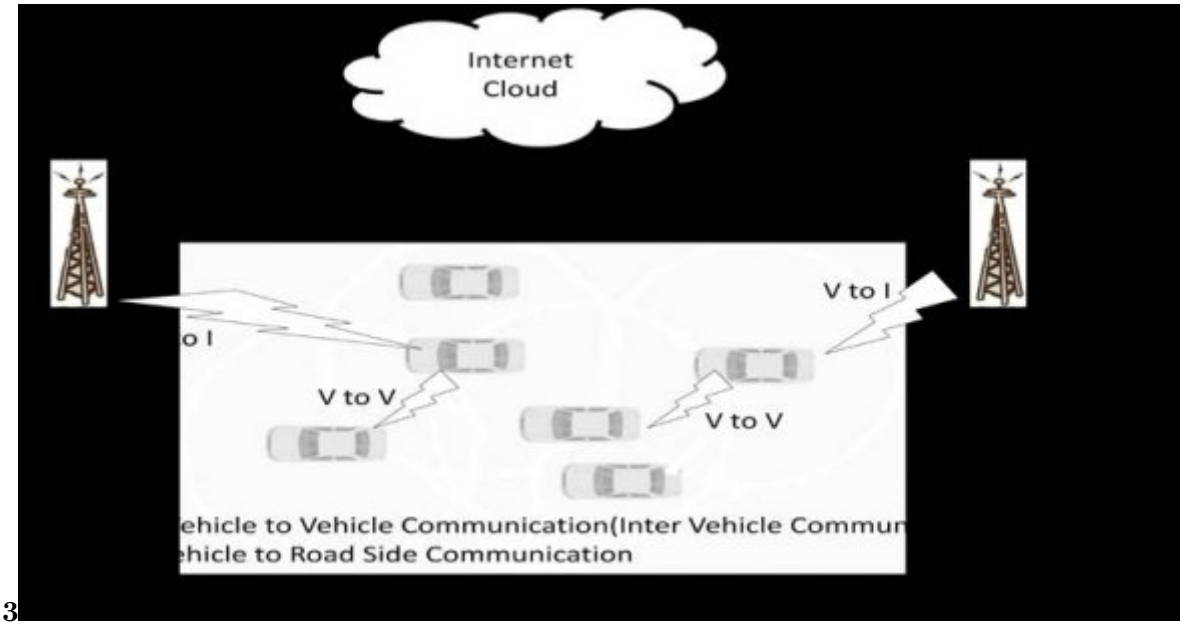
It allows the set of Connections (Network) to be completely self-organizing and self-configuring, without the need for any existing network infrastructure or administration. The protocol is bonded with the two mechanisms of Route Discovery and Route Maintenance [5], which work jointly to allow nodes to discover and maintain source routes to arbitrary destinations in the ad hoc network.

Route Discovery is the method by which a node or a Source vehicle (S) wishing to send a packet to a destination node or Destination vehicle (D) obtains a source route to D. Route Discovery is used only when S attempts to send a packet to D and does not already know a route to D.

10 Global Journal of Computer Science and Technology

11 IV. Conclusion

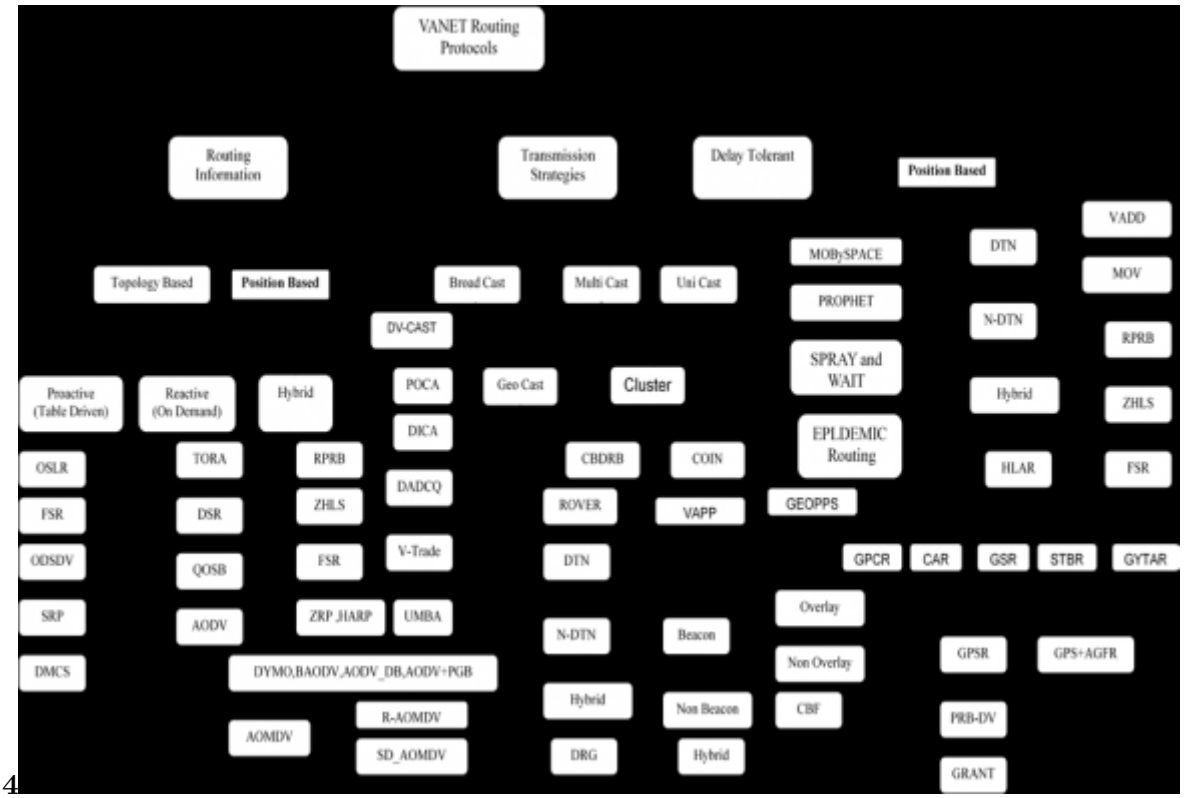
In this paper we have studied about the introduction of Vehicular ad-hoc networks and its Routing Protocols especially we have studied topologybased Reactive Routing Protocols. And we had given a table which includes the principles and techniques of different types of algorithms used in the respective category. [1] [2]



3

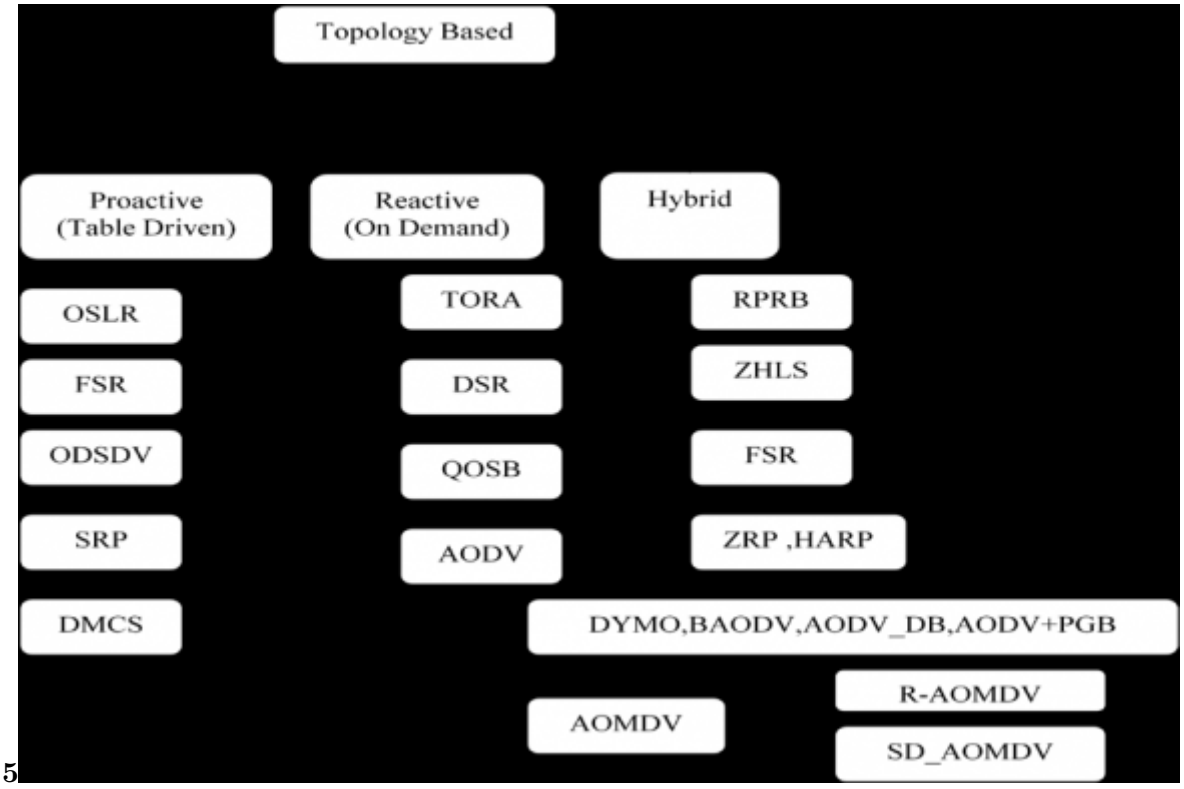
Figure 1: Fig. 3 :

[1] © 2018 Global Journals
[2] © 2018 Global Journals 1



4

Figure 2: Fig. 4 :



5

Figure 3: GlobalFig. 5 :

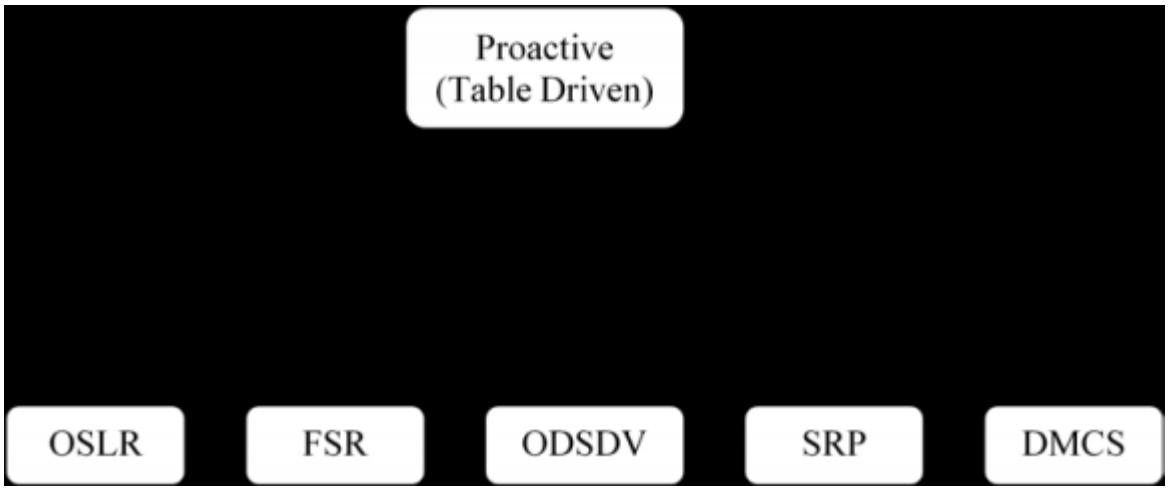
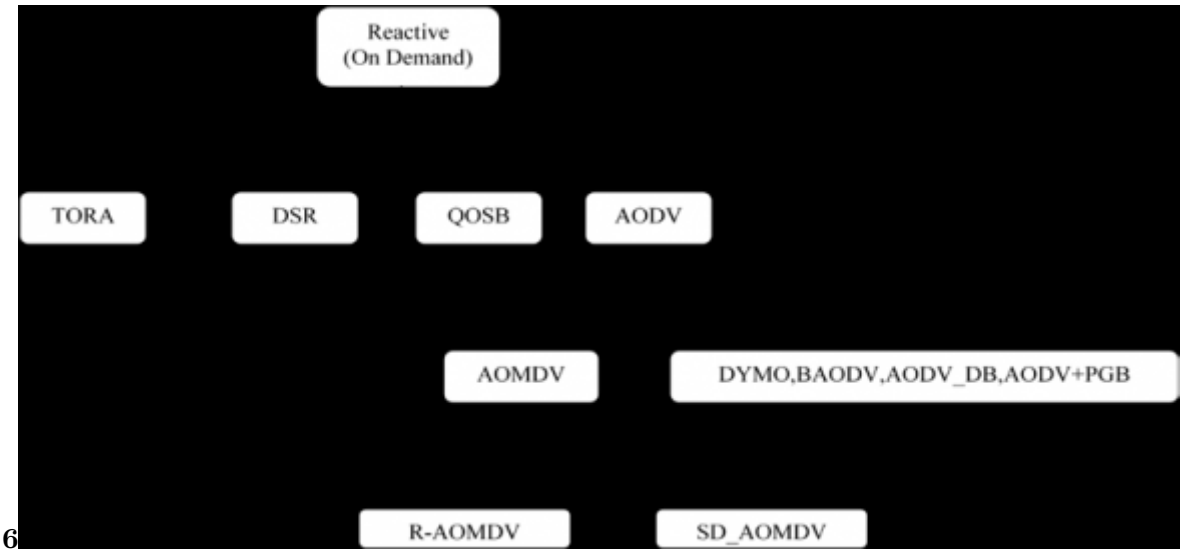
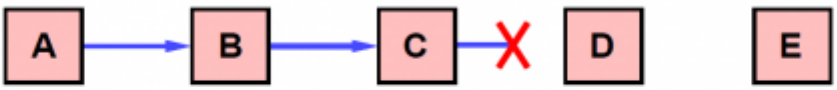


Figure 4: Volume



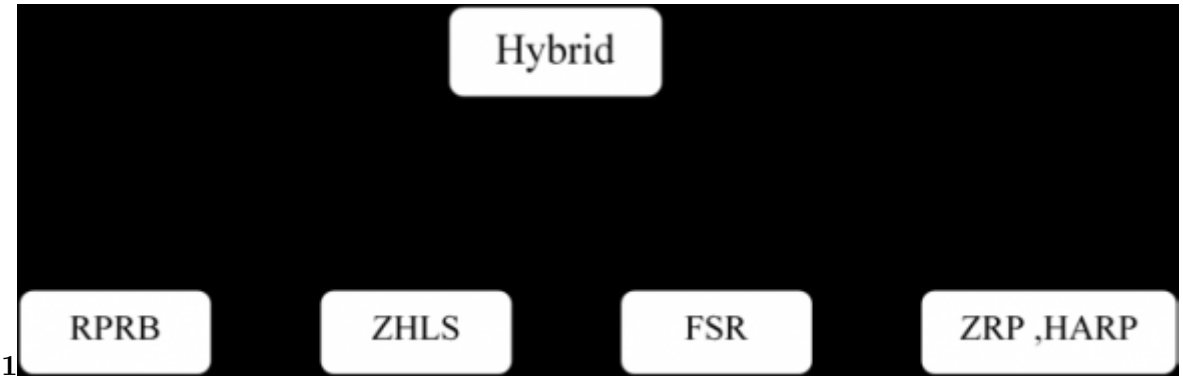
6

Figure 5: Fig. 6 :A



2

Figure 6: Figure 2 :



1

Figure 7: Figure 1 :

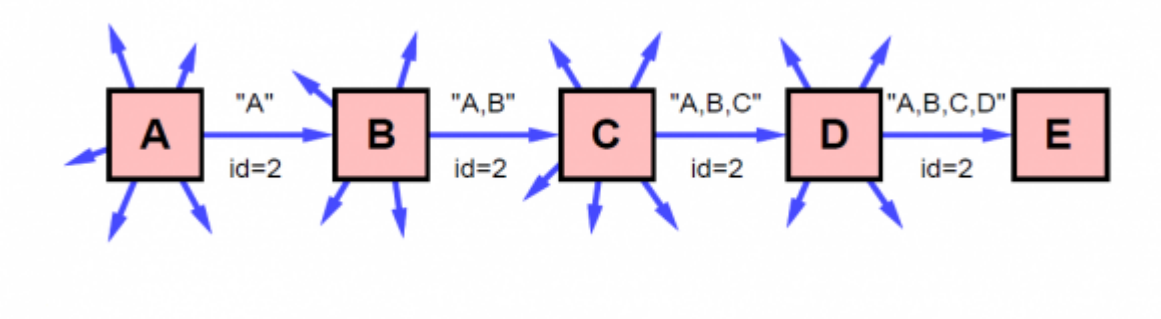


Figure 8:

Algorithm:
If (failure of link)
Generate reference level
Else If (all neighboring nodes are not at same reference level)
Propagate reference level
Else If (reference bit ==0)
Reflect Reference Level
Else If (Reference Level created by the user)
Clear Reference Level
Else
Generate Reference Level
ii. Dynamic Source Routing

Figure 9:

[Routing et al. (2017)] , Routing , In , Ad , Networks . ISSN2348-8034DOI-10.5281/zenodo.1133199. *Pavan Kumar Pagadala, Dr. N.M. Saravana Kumar, Global Journal Of Engineering Science And Researches* December 2017. 4 (12) . (A SURVEY)

[Jeevitha and Thilakavalli] 'A Study and Performance Analysis of TORA Routing Protocol in Vehicular Ad-hoc Networks'. R Jeevitha , K Thilakavalli , D . *International Journal of Information Technology and Electrical Engineering* -2306-708X. p. .

[Perkins and Royer (1999)] 'Ad-Hoc on Demand Distance Vector Routing'. Charles E Perkins , Elizabeth M Royer . *Proceedings of the Second IEEE Workshop on Mobile Computing Systems and Applications*, (the Second IEEE Workshop on Mobile Computing Systems and Applications) February 1999. IEEE Computer Society. p. .

[David B. Johnson David A. Maltz Josh Broch (ed.)] *DSR: The Dynamic Source Routing Protocol for Multi-Hop Wireless Ad Hoc Networks*, `http://www.monarch.cs.cmu.edu/` David B. Johnson David A. Maltz Josh Broch (ed.) p. . Computer Science Department, Carnegie Mellon University Pittsburgh

[Enhancing dynamic Source Routing (DSR) Protocol for Vehicular Ad-hoc network through Ant Colony Optimization Internation 'Enhancing dynamic Source Routing (DSR) Protocol for Vehicular Ad-hoc network through Ant Colony Optimization'. *International Journal of Science, Engineering and Technology Research (IJSETR)* 2278 -7798. June 2016. Praveen Sharma. 5 (6) .

[Enhancing the Performance of DSR Routing Protocol Using Link Breakage Prediction in Vehicular Ad Hoc Network, Khalid Zah 'Enhancing the Performance of DSR Routing Protocol Using Link Breakage Prediction in Vehicular Ad Hoc Network, Khalid Zahedi, Yasser Zahedi , Abd Samad Ismail'. *International Journal of Computer Networks and Communications Security* 2308-9830. JUNE 2013. 1 (1) p. .

[Johor Darul Takzim, Malaysia Affiliation, Topology based Routing Protocols for Vanet and their Comparison with Manet Journa 'Johor Darul Takzim, Malaysia Affiliation, Topology based Routing Protocols for Vanet and their Comparison with Manet'. *Journal of Theoretical and Applied Information Technology*

[Reddy et al. ()] V Reddy , P Siva Prasuna , Rittika D Varu , P Nikhila , N Srilakshmi . *Performance Analysis of DSDV, DSR Routing Protocols in Vehicular Ad-Hoc Network(Vanets)*, 2015. 6 p. .