Comparative Study of Routing Protocols and Dempster Shafer

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Abstract— Vehicular Ad Hoc Network (VANET) is a sub class of Mobile Ad-Hoc Networks (MANET). VANET provides wireless communication among vehicles and road side equipment. The communication between vehicles is used for safety, comfort and for entertainment as well. The performance of communication depends on how better the routing takes place in the network. Routing of data depends on the routing protocols being used in network. In this paper, our main aim is to compare the performance of Ad Hoc on Demand Distance Vector (AODV) and watch-dog timers. For the performance evaluation of routing protocols a simulation tool 'NS-2' has been used.

Keywords— **Ad-hoc Network, VANET, AODV, NS-2.**

I. INTRODUCTION

Vehicle driving is becoming more and more challenging as the number of vehicles is increasing on the road day by day. Ad-hoc Network is an emerging technology which is an autonomous collection of wireless mobile nodes. Vehicular Ad hoc Networks (VANET) is a type of Ad-hoc Network which is advanced technology for integrating the vehicles as a network topology. VANET is mainly used for avoiding the accident and shares the traffic information among the vehicles.

In VANET, vehicles act as nodes which can exchange information between each other without any network infrastructure establishment. Each node in the network may be either a vehicle or Road Side Unit (RSU) which is equipped with the necessary communication facility. The major goal is to improve the driver's safety by informing them about dangers and situations that they cannot see. It is also used to support other services such as broadcast of weather or traffic conditions or infotainment to make a trip more pleasant to the passengers. In VANET environment, routing should be focused, as it is essential for life safety applications. The information should be broadcasted to all the entities in the network with the help of routing protocols.

Misconducting in the vehicles does still benefit from the services of the network by defacto behaving normally during the regrouping formation and does the reprehensible after the respective regrouping is formed. Hence, major challenge we are herein addressing in this paper, to diagnosis the misconducting vehicles at post of regrouping. This is performed by means of cooperative type overseer model which is reckoned on Dempster Shafer notion.
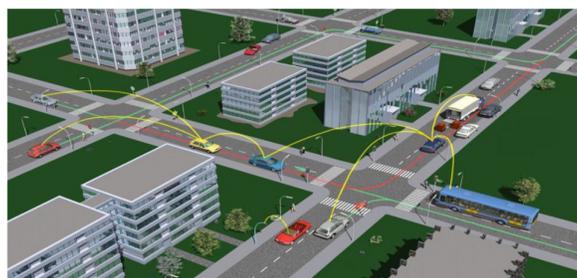

Fig. 1: Vehicular Ad Hoc Network

II.   LITERATURE SURVEY

Balasubramani [1] Designing of position based routing protocols has many challenges like high mobility vehicles, obstacles in routing path in VANET environments. VANET routing methods, merits and demerits of non-delay tolerant routing protocols. Jerome Harri [2] proposed VANETs simulations to the dutiful portrayal of vehicular portability at both comprehensive and negligible levels, leading to original uneven distributions of cars and quickness, and Singular affinity act. In this script originally there and label VanetMobiSim, a candidly accessible alternator of sober vehicular trend traces for networks simulators. Then, VanetMobiSim is validated by illustrating how the intercommunication 'tween highlighted macro- and micro-flexibility incur portray commonplace wonder of vehicular traffic. Sherali Zeadally [3] Plan an amount covenant anticipated scenarios situation the buyer cannot suggest instantaneously with the issuer (consumer's Economic Company) for certification goal. The aimd covenant uses an up-to-the-minute automated identification blueprint that reduces the contact cost (compared to certificate-based ink scenarios), and increases the adaptability of the amount deal with (for the sake of the low intelligences costs embroiled). Our Covenant supports both plastic money and smart card transactions, and protects the real equality of consumers in the interim the outlay and perhaps used by any convenient device. Sunho Lim [4] aims a cooperative cache invalidation (CCI) Strategy and its enhancement (ECCI) that step on the elemental station care proposal to weaken move of broadcast operations and the analogous doubt withhold. Promoted an analytic design for CCI and ECCI techniques for fasthand evaluate of opera trends and significant devise parameters. Then, modify two previous hideout voidance techniques to preempt IVANETs: a poll-each-read (PER) practice, and an extended asynchronous (EAS) scheme practice. Related the drama of four storehouse nullification practices as a reception of interrogate layoff, Hoard revise hiatus, and data size Straight expanded reproduction. Feng Li and Jie Wu [5] one Decisive grouping send in VANETs commit persuade vehicles and their drivers to collaborate and make bag forwarding in vehicle-to-vehicle or vehicle-to-roadside information. In this script, delve into this complication, resolve the drawbacks of two uncomplicated practices, and ready a settle stimulus strategy to arouse participation in VANETs. Illustrate the assessment of donation pursuant to the extraordinary characteristics of VANET intelligence. Our Practice uses the lob profitable unit to safeguard suitability.

III.   ROUTING PROTOCOLS

Routing is a process of selecting a path for traffic in the network or between multiple networks and to choose a path to send data from source to destination. A routing protocol decides the way of exchanging information in two communication entities. It includes the procedure in establishing a route, forwarding decision and maintaining or recovering from routing failure. High mobility of nodes in VANET system make design a routing protocol challenging issue and responsible to compute and maintain efficiently routing paths among the vehicles. So far, several routing protocols have been developed, adapted and improved from algorithms that proposed in the past of MANET.
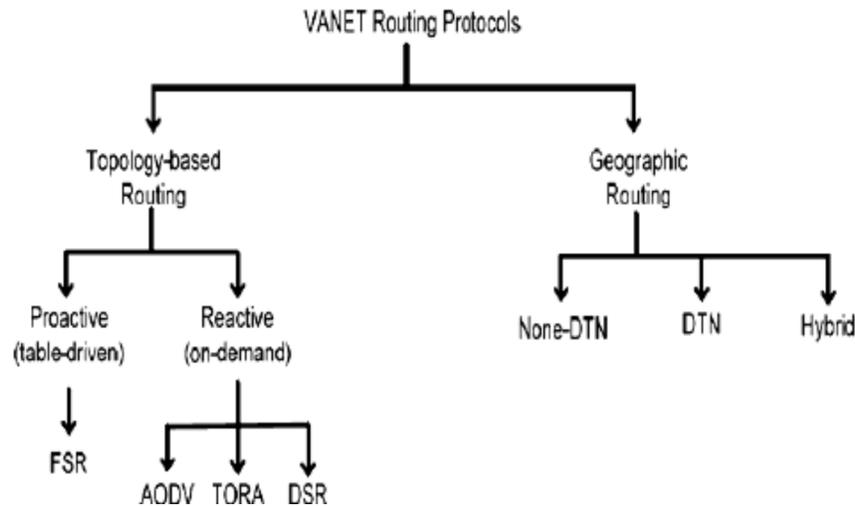
Fig. 2: Classification of routing protocols in VANET

A. Fisheye State Routing

This is an active link say routing that maintains a topography map at each node and propagates link affirm updates with only immediate neighbors not the full network. Furthermore, the link articulate info is announce taciturn frequencies for original entries providing their hop separation to the current node. Entries that are closer are advertised with larger recurrence than the remoter nodes. The exaggeration in routing gets changed as packets procedure progressively closer to the harbor in as much as the rebate in advertise overhead.

B. AODV

In VANET, nodes (vehicles) have high mobility and moves with high speed. Proactive based routing is not suitable for it. Proactive based routing protocols may fail in VANET due to consumption of more bandwidth and large table information. AODV is a reactive routing protocol, which operates on hop-by-hop pattern. Route Requests (RREQs), Route Replies (RREPs), and Route Errors (RERRs) are the message types defined by AODV. In AODV routing, upon receipt of a broadcast query (RREQ), nodes record the address of the node sending the query in their routing table (Figure a). This procedure of recording its previous hop is called backward learning. Upon arriving at the destination, a reply packet (RREP) is then sent through the complete path obtained from backward learning to the source (Figure b). At each stop of the path, the node would record its previous hop, thus establishing the forward path from the source. The flooding of query and sending of reply establish a full duplex path. After the path has been established, it maintains as long as the source uses it. A link failure will be reported recursively to the source and will in turn trigger another query-response procedure to find a new route.

a) Propagation of the RREQ   b) Path of the RREP to the source
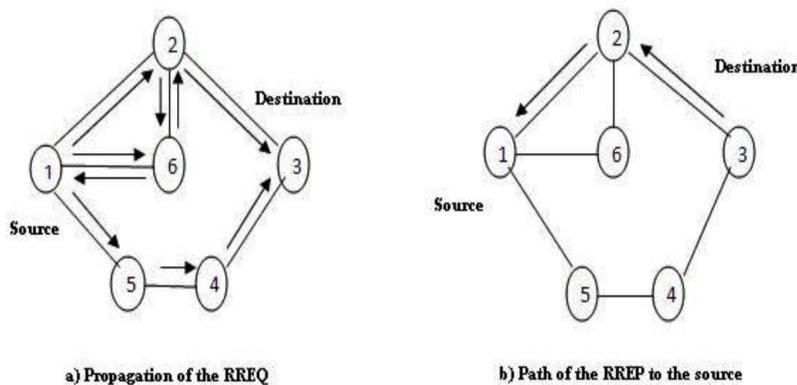
A. DSR

Dynamic Source Routing uses origin routing, as the array of midway nodes on the routing path is maintained in a data folder of the authority. In DSR, the IDs of the intervening nodes sweeping has traversed are copied in the interrogate carton. The target then retrieves the entire path from the doubt folder, and uses it to feel for the cause. As a culminate, the expert establishes a path to the terminal. If the harbor can do to send multiple transmit replies, the origin node may reap and drugstore multiple roads from the target. When some link in the current itinerary breaks then an alternate program is used. In a structure with low maneuverability, this is an convenience over AODV as the alternative line mayhap demonstrated sooner the DSR initiates added flood for itinerary finding. The ruling disagreement between AODV and DSR is that in AODV data bags send the terminal send, site as in DSR, data bags send the full routing science that shows that DSR has potentially more routing alofts than AODV. Furthermore, as the structure width developments, the amount of aloft in the data folder continues to raise. The second argument is that in AODV, line retort containers transport the haven sermon and the string estimate, time in DSR, the transmit counter folders transport the home of each node along the line.

B. TORA

Temporally Ordered Routing Algorithm routing follow a clan of link turnaround routing findings station the prominence of the tree firm at the origin is used to assemble a focused directed acyclic graph (DAG) willing the target that directs the flow of folders and ensures their reachability to all the nodes. The node announces the container when it has a bag to send. It's adjoin then announces the carton if it is the sending node's downward link situated on the DAG. A node constructs the focused visual representation by television a inquire folder. Upon accepting a interrogate wrapper it will advertise a acknowledge carton, if it has a downward link to the target; or then, it totally drops the carton. A node, upon earning a acknowledge container, updates its prominence only if the ceiling from the acknowledge wrapper gives the minimal of all the maximums from react folders it has acknowledged formerly. It then re announces the acknowledge container. The leverages of TORA are that the implementation of the conclusion gives a transmit to all the nodes in the organization and it reduces pervasive control messages to a set of abutting nodes. However, ago it provides a road to all the nodes in the structure, maintenance of the above-mentioned lines is a ponderous task, chiefly in highly dynamic VANETs.

The respective nodes does the according to their respective observations. Afterwards, the observations are herein shared among the respective nodes, which is located in the same required regrouping hence each represented nodes amasses herein all the scrutiny considering Dempster Shafer to make the ultimate decision.

Reduces the detection time and overhead. Detection model is able to augment the probability of detection, decrease the false negatives, and debases the percentage of egotistical nodes in the vehicular network.

IV.   COMPARISON OF ROUTING PROTOCOLS AND WATCH-DOG TIMERS

The Ad hoc On-Demand Distance Vector (AODV) algorithm enables dynamic, self-starting, multi hop routing between participating mobile nodes wishing to establish and maintain an ad hoc network. AODV allows mobile nodes to obtain routes quickly for new destinations, and does not require nodes to maintain routes to destinations that are not in active communication.

TORA has three of the mechanisms. Communication in the network is represented downstream. When the respective source node has the route to terminus, it does initiates with the spawning of the route by broadcasting the respective QRY. Inducement are herein provided in the form of expressing as privilege and it does linking to the services of network basically to provoke the vehicles to conduct in coordination. The vehicles still misconduct from the network of services primarily by behaving in a normal manner at the regrouping arrangement and does misconducts after regrouping which are formed. To diagnose misconduct the respective vehicles, which is the cooperative overseer model reckoned on Dempster Shafer, where it is evident are aggregated and also cooperative type decisions which are made.

DSR being the reactive type routing protocol is able to manage the MANET which without providing the periodic table update messages like those of the table driven routing as the protocols do. It was herein specifically designed basically for the use of the multi hop wireless improvised type networks. Protocol of the improvised does permits the network, which needs to be absolutely of self-organizing and which does mean where there is no need for an existing type network as the infrastructure or the administration.
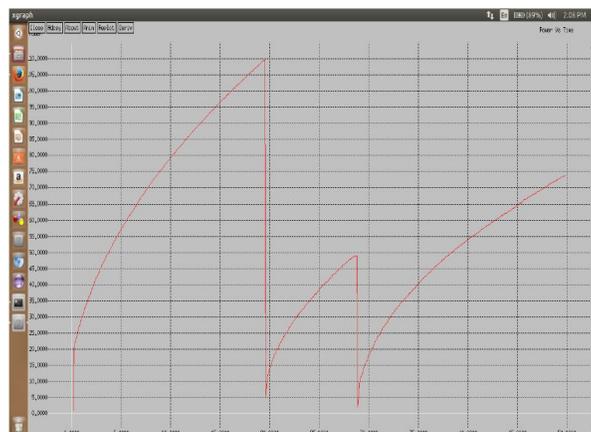
V.   RESULTS AND CONCLUSION

Fig 3: Simulation of AODV

Open the terminal window using the command Ctrl+Alt+t. Run the program using the command ns filename.tcl. The number of nodes will be set and the antenna distance will be calculated. The file generated after the execution is put in gedit file and then the xgraph is generated for the simulation and then run using xgraph filename.xg.
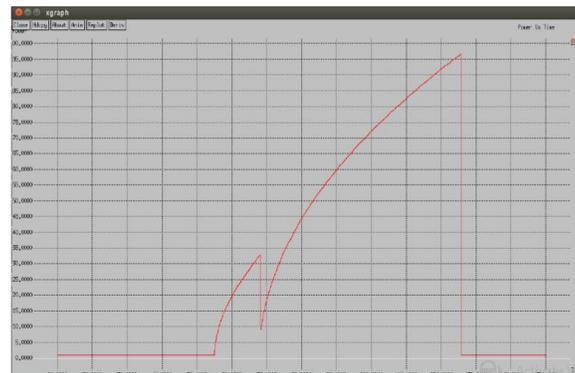

Fig 4: Simulation of DSDV

Open the terminal window using the command Ctrl+Alt+t. To execute the program change the present directory using the command. Run the program using the command ns filename.tcl. The number of nodes will be set and the antenna distance will be calculated. The file generated after the execution is put in gedit file and then the xgraph is generated for the simulation and then run using xgraph filename.xg
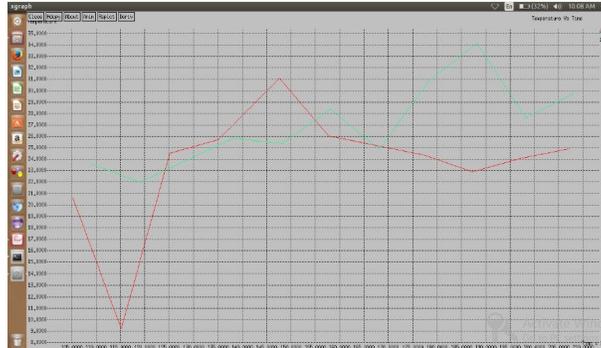

Fig 5: Comparison of AODV and DSDV

VI.   CONCLUSION

The inspect of the discrete routing obligations studied in VANET on the support of their architectures. If we call for the best aside the existing contracts then we find that the Reactive contracts will be the best still for the cooperative manner of the vehicles while regrouping arrangement or after regrouping the vehicles will misconduct so Dempster Shafer is the one that which is located in the same required regrouping hence each represented nodes amasses herein all the scrutiny considering Dempster Shafer to make the ultimate decision.

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