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OLSR Parameter Tunning

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***Abstract**— Vehicular ad hoc network is an infrastructure less network where each network node not only acts as a host but also acts as a router. The environment is highly dynamic due to mobile nature of nodes. The proper functioning of these networks depends upon a routing protocol that can respond to the rapid changes in the topology. Our interest is focused on the OLSR routing protocol, which uses hello and topology control (TC) messages to discover and then disseminate link state information throughout the mobile ad hoc network. We discuss the impact of Hello messages on the performance of OLSR in term of packet delivery ratio, delay and throughput. The objective of this thesis is to study the impact of tuning on the performance of mobile routing Protocol, OLSR, which is proactive routing protocol. Since not many VANETs have been deployed, most of the studies are based on simulation. Also for this thesis, experiments are conducted by network simulator 2.34 by using tool command language. A basic framework is employed to analyze the performance of routing protocol OLSR by tuning its parameters. We firstly evaluated the performance in terms of QOS by applying an optimization strategy that obtains automatically efficient OLSR parameter configurations by coupling two different stages: an optimization procedure and a simulation stage. It is observed that tuned-OLSR outperformed OLSR. The three basic parameters are tuned by applying genetic (GA), simulate annealing (SA) and particle swarm (PSO) algorithms. It shows considerable increase in throughput, packet delivery ratio and a substantial decrease in delay as compared to the respective performance of OLSR. The optimization methodology presented in this work (coupling meta heuristics and a simulator) offers the possibility of automatically and efficiently customizing any protocol for any VANET scenario*.

***Keywords**— OLSR, PSO, GA, SA*

I. INTRODUCTION

1.1OLSR:
OPTIMIZATION LINK STATE ROUTING PROTOCOL is a proactive routing protocol for mobile ad hoc networks. OLSR is an optimization over the classical link state protocol, tailored for mobile ad hoc networks. OLSR is designed to work in a completely distributed method and does not depend on any central unit. The protocol inherits the stability of a link state algorithm and has the advantage of having routes immediately available when needed due to its proactive nature [1].

1.2OLSR-L: Optimized Link State Routing and Localization:
In the wireless multi-hop network, the data communication and positioning protocols are techniques that jointly interact.in location aided routing (LAR) [2] redundant flooding is controlled by formative the location information for a terminal. Geographical adaptive fidelity GAF enable low power consumption using location information location information improves the data communication protocol [3]. Therefore, a positioning protocol is necessary to acquire the location information. The global positioning system (GPS) might be used as a simple result. GPS rises node hardware costs and it cannot be used indoors. Therefore, training all the nodes with GPS is not a practical solution. Hence, a positioning protocol is need to obtain the position of a node autonomously without being depend on GPS. The positioning protocol consists of ranging (dimension of distance) and positioning (calculation of position) phases. The ranging protocols includes time-of-arrival (TOA), time difference of arrival (TDOA), and received signal strength (RSS). Overhead naturally occurs with ranging. The positioning protocols need data communication protocols to provide location information. When a positioning protocol is used, this overhead has to be taken into account [4].

1.3OLSR Routing Protocol Optimization for VANETs:
VEHICULAR ad hoc networks (VANETs) are selfconfiguring networks where the nodes are vehicles(equipped with on board computers), elements of road side infrastructure, sensors, and pedestrian personal device Wi Fi (IEEE 802.11 based) technologies are used for deploying such kind of networks.[5] In VANETs, the Wi Fi limitations in coverage and capacity of the channel, the high mobility of the nodes, and the presence of problems generate packet loss, frequent topology changes and network fragmentation. Thus, a great deal of effort is dedicated to offer new MAC access strategies and to design efficient routing protocols.

Most of VANET requests critically rely on routing protocols. Thus, an optimal routing strategy, that makes better use of resources, is crucial to deploy efficient VANETs that actually work in volatile networks.[6] Finding well-suited parameter configurations of present mobile ad hoc network protocols is a way of improving their performance, even creation the difference between a network that does work or does not, e.g. the networks with high routing load bear from congestion and cannot ensure timely and reliable delivery of messages [7].
Genetic Algorithms(GA)are one of the most popular metaheuristic algorithms. A Genetic algorithm repeats a process, and with a given selection criterion selects the two parents from the entire population, they are then recombined, the resulting offspring's are mutated, and at the end they are calculated and inserted back into the population following a given criterion[8].[9] Recently there has been increasing interest in exploring computations and communication capabilities in transportation system. Many automobiles manufacture started to equip GPS, digital map and communication interface with new vehicles. Exiting cars can easily upgrade with the fast advance of information technology. The rising demand of wireless communication and the need of new wireless devices have tend to research a self organizing, self healing network without the interference of centralized or pre established infrastructure. The networks with the nonappearance of any centralized infrastructure are called ad hoc networks [10]. Vehicular Ad Hoc Network (VANET) is the special class of Mobile Ad Hoc Networks (MANET) [11] with unique feature.

2. The Routing Protocols in VANETS

[12]Topology-based routing protocols use the link's state information that exists in the network to perform packet forwarding. Many researchers have investigated the performance of various topology-based routing protocols within the vehicular environment, and their results have exposed that the ad hocon-demand distance vector (AODV) protocol [13] has the top performance and lowest routing overhead among all topology based routing protocols [14]–[15]. The common typical among all topology-based routing protocols is that the performance degrades as the network size rises, indicating the scalability problem [14].
It is widely believed that geographic (or location-based) routing clasps the key to the scalability problem. The key reason for this belief is that, because geographic routing protocols do not discussion any link-state information and do not establish and maintain any routing tables, they should operate below a much reduced routing overhead. As such, geographic routing holds great promise for highly dynamic environments such as VANETs. In the context of VANETs, the forwarding choice by a vehicle using geographic routing is mainly based on the position of the destination vehicle and the position of all vehicles' one-hop neighbors. The position of the destination is stored in the header of the packet that was transmitted by the source vehicle. The position of all vehicles' one-hop neighbors is obtained by listening to the beacon packets that are periodically sent between vehicles. Geographic routing accepts that each vehicle knows its location, e.g., through an on board Global Positioning System (GPS). Geographic routing also assumes that the sending vehicle knows the receiving vehicle's location [16].

2.1 The routing protocols in VANET are categorized into six types:

- Topology based
- Position based
- Geo cast based
- Cluster based
- Broadcast based
- Infrastructure based.

Topology based protocols: These protocols study the route and maintain a table before the sender start transmit data.
They are divided into three categories:

I. Proactive protocols.
II. Reactive protocols
III. hybrid protocols.

- **Proactive protocols:** The proactive protocol is also recognized as table driven routing protocol. These protocols work by exchanging the knowledge of topology among the nodes of the network.

There are further routing protocols that fall under this category:

- Fisheye state routing (FSR)
- Optimized Link State Routing Protocol (OLSR)
- Topology Dissemination Based on Reverse-Path.

Fisheye state routing (FSR)[17]: It is similar to link state routing protocol (LSR). Each node maintains a topology table based on the modern information received from neighborhood nodes. It uses different exchange period for different entries in routing table to reduce the size of regulator messages in large networks. The disadvantage in FSR routing, is the size of the routing table increases with rise in network size.
Optimized Link State Routing Protocol (OLSR)[18]: It is an optimization of a wholesome link state protocol for mobile ad hoc networks. Each node in the network picks a set of neighbor nodes called as multipoint relays (MPR) which retransmits its packets. The neighbor nodes which are not in MPR set can read and process the packet.

Topology Dissemination Based on Reverse-Path Forwarding (TBRPF)[19]: link-state routing protocol designe for ad-hoc networks. Every node constructs a tree which contain path to all reachable nodes by using topology table. Nodes are periodically efficient with only the differences between the previous and current network state using HELLO messages.

- **Reactive protocols:** These protocols are called as on-demand routing protocols as they periodically update the routing table, when some data is there to send. But these protocols use flooded process for route detection which reason more routing overhead and also regonise from the early route discovery process, which make them unsuitable for safety applications in VANET.

AODV[20]: source initiate routing protocol uses HELLO messages to classify its neighbors. Source node broadcasts a route request to its neighbors which forward to the destination. Then the destination uncast a route reply packet to the sender. Every node preserve broadcast-id which increment for new RREQ. when a RREQ arrives at a node, it check the broadcast id if it is less than or equal to previous message then it will remove the packet.

DSR***[***21]: It Uses source routing instead of depending on intermediate node routing table. So routing overhead is always dependent on the path length. The control of this protocol is the route maintenance process does not close by fix a out of order link. The performance of the protocol reduce with increasing mobility.

- **Hybrid protocol:** The hybrid protocols are introduce to decrease the control glide of proactive routing protocols and drop the initial route discovery stay in reactive routing protocols.

Zone routing protocol (ZRP)[22]: In this the network is divided into overlapping zones. The zone is defined as a collection of nodes which are in a zone radius.

Position Based Protocols: Position based routing consists of class of routing algorithm.They part the property of using geographic positioninginformation in order to select the next forwarding hops. Position based routing is divided in two types: Position basedgreedy V2V protocols, Delay Tolerant Protocols[23].

Cluster Based Routing Protocols: Cluster based routing is ideal in clusters. A group of nodesidentifies themselves to be a part of cluster and a node isdesignated as cluster head will broadcast the packet to cluster.Good scalability can be provided for networks but networkDelays and overhead are incurred when forming clusters in highly mobile VANET.

The Clusters based routing protocols are COIN, LORA-CBF, TIBCRPH, CBDRP[23].

Geo Cast Routing Protocols: Geo cast routing is a location based multicast routing.Its objective is to deliver the packet from source node to allother nodes within a specified geographical region (Zone ofRelevance ZOR). The various Geo cast routing protocols areIVG, DG-CASTOR and DRG[23].

Broadcast Based Routing Protocols: Broadcast routing is frequently used in VANET for sharing, traffic, weather and emergency, road conditions among vehicles and delivering commercials and announcements. The various Broadcast routing protocols are BROADCOMM, UMB, V-TRADE, and DV-CAST [23].

3. Routing Basics And Architecture For VANET

Routing is learning how to grow from here to there, in routing are both source and destination dependent. The trust criteria for successful routing in VANET are correctness, reliability and .most route i.e. one that take the least time. VANET is an Open architecture, which based on principle that account for what is happening in the world rather than optimal solution. The VANET routing architecture applies to hop-by-hop connectionless open system routing in general. Based on comment routing architecture should possess the following points .i.e. Scale well, support different sub networks, adjust to dynamic topology[9].

For the wireless access in vehicular environments (WAVE) IEEE 802.11p standard is defined by IEEE 802 committee. 75 MHz of the bandwidth has been gave to vehicle to vehicle (V-V) for short range communication while 5.9 GHz for vehicle to infrastructure (V-I) communication respectively. Dedicated short range communication (DSRC) is also used by VANETs [9]. DSRC is suitable for 1km choice used both by (V-V) and (V-I) [24].

3.1 OLSR protocol aspect:

To preserve the topology information of the whole network OLSR exchange messages from time to time for every attendance of mobility and failures. HELLO, Topology Control (TC) and multiple interface declaration (MID) messages are three types of messages used for performing arts the hub functionality. HELLO messages are exchange between nodes which are next to each other's (1-hop distance). They occupied to provide lodgings to Link sensing (LS), Neighbour covering detection (ND), and MPR selection signaling . OLSR is a link-state routing protocol that relies on employing capable interrupted flooding of control in by using single nodes to do something as multipoint Relays (MPRs). The implementation of MPRs piped the amount of necessary transmissions. These messages are produced recurring, containing information about the adjoining nodes and about the links between their network integrations. TC messages are produced periodically by MPRs to indicate which other nodes have selected it as their MPR. The information is stored in the topology information base of each network node, which is used for routing table calculations. Such messages are air to the other nodes from side to side the link. Since TC messages are broadcast periodically, a ordering number is used to identify between recent and old ones. MID messages are aired by the nodes to knowledge about their system interface engaged to take part in the link. Such information is needed since the nodes may have multiple interfaces with exact addresses taking part in the system.

3.2 Multipoint Relays (MPRs):

The idea of multipoint relays (MPRs) is the slide of flooding messages in the network by reducing disused retransmissions in the like region. Each node in the network select a set of nodes in its symmetric 1-hop neighborhood which may retransmit its messages. This set of selected touching nodes is called the "Multipoint Relay" (MPR) clan of that node.

4. VANET Supports Two Types Of Communication

Vehicle to vehicle and vehicle to infrastructure communication. In vehicular communication, information generation and distribution occur with the vehicle to vehicle to infrastructure.

4.1 Vehicle to Vehicle ad-hoc networks:

This is also known as pure ad-hoc network which allows direct vehicular communication without need of fixed infrastructure support.

4.2 Vehicle to Infrastructure network:

This type of network use a cellular gate way and wireless local area network access point to allow a vehicle to communicate with the roadside units mainly for information and data gathering application.[25]

5. Characteristics of VANET

- Dynamic topology- One of the most important type of VANET is dynamic topology. In this nodes or vehicles go with high speed in admiration to each other.
- No power constraints and adequate storage -In VANET, we are using vehicles as nodes instead of other devices so vehicles have sufficient amount of energy and power including both processing and storage; so the battery power and storage is not an issue in VANET.
- Different communication environments - VANET has two types of environments i.e. highway environment & city environment[26].

6. Challenges of VANET:

- Hidden terminal problem- This problem may occurs when two or more objects sends packets
- Error prone shared ratio- In VANET, during propagation the radio wave go through several impairments such as attenuation, multipath propagation and interference.
- Lack of central coordination- In VANET, there is no central controllers to coordinate the activity of nodes[38].

7. VANET has following different features [27]:

- **a**. The ability of moving vehicles is highly predictable because vehicles are moving with only two directions on the same road.
- **b**. Vehicles provide lots of electric power to the wireless sensing devices which are already present in the vehicles.
- **c**. In VANET, broadcast communication is used to deliver information from sender to receiver instead of unicast communication.

II. RELATED WORK

The research work performed in this field by different researchers is presented as follows:

Zheng Li, Nenghai Yu, Zili Deng in 2008 : OLSR is a routing protocol which reducE the overhead of control messages by choosing MPRs. So, the number of MPRs is a key for the presentation of OLSR. the greedy algorithm presented in RFC 3626 has certain problems with MPR selection, which will create a negative result on the performance of OLSR, a new algorithm called necessity first algorithm (NFA) is proposed here with the aim of answering the tricky of greedy algorithm and reducing the number of MPRs[10].

Yang Cheng Huang ,SaleemBhatti 2006: Optimised link state routing protocol (OLSR) is a popular routing protocol used in VANET networks. In this paper ,we check the different effects of tunning refresh intervals timers on OLSR performance under various scenarios. Based on the imitation results with NS2. We find by reducing the intervals we can recover the OLSR performance. we find that impacts of the interval time grows with the increase of network mobility and node density[28].

Kazuyoshi Soga, TomoyaTakenaka 2010: Localization protocol is important for guessing node positions in a wireless multi-hop network. Routing protocol is also important for controlling paths. In previous research, localization and routing protocols have been conversed and evaluated differnt. In this paper, we offer an integrated protocol for the optimized link state routing (OLSR) and OLSR based localization (ROULA). Our protocol enables simultaneous localization and routing. ROULA's localization is performed using OLSR overhead such as hello packets and routing tables. The routing outlays and the processing actions can be efficiently integrated. We establish that the integrated protocol for ROULA and OLSR enables simultaneous localization and routing [2].

Jagadeesh Kakarla, S Siva Sathyaagust 2011: Vehicular ad-hoc networks (VANETs) propose a number of application without any bear from set infrastructure. These applications ahead messages in multi-hop style. Designing an effective routing protocol for all VANET presentation is hard. Hence a survey on routing protocols based on various parameters of VANET is a necessary matter in vehicle-to- vehicle (V2V) and infrastructure-to- vehicle (IVC) communication. idea of unlike routing algo in VANET with main classifications. The protocols are also based on their essential self and tabulated [24].

Uma Nagaraj , Dr. M. U.Kharat Dec 2011: ad hoc networks that give a famed approach for Intelligent Transport System (ITS). The review of routing protocols in VANET is important and essential for ITS. THE converse the advantages/disadvantages and applications of different routing protocols for vehicular ad hoc networks. It discovers the motivation behind the designed, and traces the evolution of these routing protocols. This paper have main 5 types of protocols for VANET Topology Based, Positioned Based, Geo Cast, Broad Cast, Cluster Based Protocols[23].

Er. GulshanRana, Prof. .Mahesh Kumar july 2015: OLSR routing protocol is one of the most used proactive routing protocol used in VANETS. It can be viewed as an autonomous network, consist of multiple sensor nodes, which are mobile in nature. The routing is the a good number of key issue in VANETS, as the nodes are mobile in nature, so it is not likely to have a fixed topology. The paper presents an optimization technique to tune the parameters of OLSR protocol for routing operations. The paper discuss the impact of genetic algorithm which overall improves the performance of algorithm by tuning parameters and debating the variation shown by the results[31].

Sugendha, Bandana Sharma may 2015:

This paper presents a class of routing protocols for vehicular ad hoc networks (VANETs) called the Optimized link state routing protocol (OLSR). OLSR protocol performs well in networks taking changing topology of nodes, as it can familiarize in such environments easily and updated routing table is maintained by all nodes all the time. Wide range of improvement is possible by changing only the configuration parameters of OLSR protocol.

Modification to the OLSR protocol is needed to rise the performance of the OLSR protocol in a VANET . This can be done by implementing Genetic Algorithm on OLSR protocol and this result in fine auto-tuned OLSR configuration. Performance becomes improved in terms of increased PDR and Throughput and reduced End to End Delay with optimized-OLSR (OLSR-GA) protocol[8].

RadhikaChauhan, NitinGoyal 2016: OLSR (Optimization Link State Routing Protocol) be designed for mobile ad hoc networks (MANETs), but later on it is used for WSNs (wireless sensor networks) and vehicular ad hoc networks (VANETs) . The protocols build and maintains the route linking source and the destination with least cost with the help of Hello and control messages. The OLSR protocol is suitable for high density networks. The OLSR operation allow an easy integration into existing operating system. The production of network depends upon the routing protocol. OLSR does not give the suitable performance with alive values of parameters. Therefore it is essential to modify OLSR parameters for improved performance. The objective of this paper is to study the a lot of techniques used for parameter tuning for OLSR and analyze the breach between these techniques. This is accomplished by simulation study of the existing techniques using NS2 simulator[30].

Venkaiahnaidu.A, B.RameshBabufeb 2012: Ad hoc On-Demand Distance Vector (AODV) is a reactive routing protocol that establishes a route based requirement. By ducking counting-to-infinity problem it perform better when compare to common routing protocols of the Internet such as IGRP, EIGRP, OSPF, RIP, and IS-IS. Though reactive and on-demand, AODV not use on all available dynamic range resources in mental wireless mesh networks yet maintaining a high throughput to route packets. The motive of the paper we propose an better AODV protocol named AODV-COG that provide an interface to a route for efficient usage of the spectrum and finding a path with high throughput among the path with same hop count. Simulations in NS-2 need changes to support cognitive wireless mesh network conditions. In this paper our focus on Optimized Link State Routing Protocol (OLSR) [29].

Mohammad Al-Rabayah and Robert Malaneyjuly 2012: Vehicular ad hoc networks (VANETs) mobile wireless networks that are designed to support vehicular safety, traffic checking, and other commercial applications. Within VANETs, vehicle mobility will reason the communication links between vehicles to normally be broken. Such link failures need a direct response starting the routing protocols, important to a potentially too much add to in the routing overhead and degradation in network scalability. In this we propose a new fusion location-based routing protocol that is mainly designe to address this . Our new protocol combine features of reactive routing by location-based geographic routing that professionally uses the location information available. The protocol is designed to adorably exit to reactive routing as the location information degrades .We show through analysis and simulation that our protocol is scalable optimal overhead, even in the presence of high location errors. Our protocol provides an enhanced yet practical location-enabled solution that can be deployed in all VANET-type environments [12].

III. PROPOSED WORK

3.1 Problem Analysis

The most salient feature of VANETS is the exchange of up-to-date information among vehicles. For this, packets travel from one node to another. But in a network with high mobility and no central authority, travelling becomes a complex task. The routing protocol operates in the core of VANETs, finding updated paths among the nodes to allow the effective exchange of data packets. For this reason this thesis deals with the optimization of a routing protocol, specifically the Optimized Link State Routing (OLRS) protocol.

3.2 Technique used

3.2.1 Conversion of OLSR to OLSR-SA, OLSR-GA and OLSR-PSO

The main drawback of OLSR is the necessity of maintaining the routing table for all the possible routes. Such a drawback is negligible for scenarios with few nodes, but for large dense networks, the overhead of control messages could use additional bandwidth and provoke network congestion. However, this precise performance of OLSR depends significantly on the selection of its parameters. Here, genetic algorithm, simulate annealing and particle swarm optimization are applied to changes the time interval for broadcasting HELLO messages. Thus, computing an optimal configuration for the parameters of this protocol is crucial before deploying any VANET, since it could decisively improve the QoS, with a high implication on enlarging the network data rates and reducing the network load. All these features make OLSR a good candidate to be optimally tuned and justify our election.

3.2.2Tuning of Parameters

The standard configuration of OLSR offers a moderate QoS when is used in VANETs. Hence, taking into account the impact of the parameters configuration in the whole network performance, we tackled here the problem of the optimal OLSR parameter tuning in order to discover the best protocol configuration previously to the deployment of the VANET. The standard OLSR parameters are defined without clear values for their ranges. According to that, we can use the OLSR parameters to define a solution vectorof real variables, each one representing a given OLSR parameter. This way, the solution vector can be fine-tuned automatically by an optimization technique, wh the aim of obtaining efficient OLSR parameters configurations for VANETs hopefully outperforming the standard one defined in the RFC 3626. Additionally, analytic comparisons of different OLSR quality metrics and their performances as the ones done in this article can help the experts to identify the main source of communication problems and assist them in the design of new routing protocols.

3.3 Proposed Work

In the paper, optimization strategy used to obtain automatically efficient OLSR parameter configurations is carried out by coupling two different stages: an optimization procedure and a simulation stage. We use a simulation procedure for assigning a quantitative quality value (fitness) to the OLSR performance of computed configurations in terms of communication cost. For this work, ns-2 has been modified in order to interact automatically with the optimization procedure with the aim of accepting new routing parameters, ns-2is started and evaluates the VANET under the circumstances defined by the OLSR routing parameters generated by the optimization algorithm. In order to evaluate the quality or fitness of the different OLSR configurations (tentative solutions), Communication cost function have been defined in terms of three of the mostCommonly used QoS metrics in this area :Packet sent, Packet received, packet dropped.

IV. RESULTS AND ANALYSIS

To increase the throughput, packet delivery ratio and to decrease End-to-End Delay and packet drop Genetic, Simulate annealing and Particle swarm optimization algorithms are used. The data are selected and transferred from the source to the destination. In this we implemented the simulation of OLSR protocol and calculated its performance such as throughput, packet delivery ratio, packet drop and end- to-end delay. An attempt is made to analyze the impact of “Hello packets” on the packet delivery ratio, delay and throughput. An attempt is made to improve the performance of algorithm by varying time interval of “Hello” packets and discussing the variation shown by the results. Normally or default value of OLSR is set at 2.0 Hello interval.

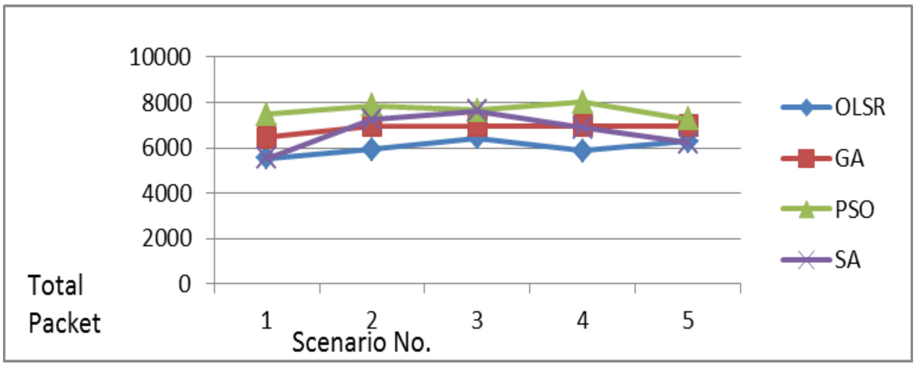

Figure1.1

Comparisons of various optimization techniques on the basis of total packet received.

From the above figure, we can conclude that PSO has highest packet received and OLSR has lowest packet received

Total packet droped:

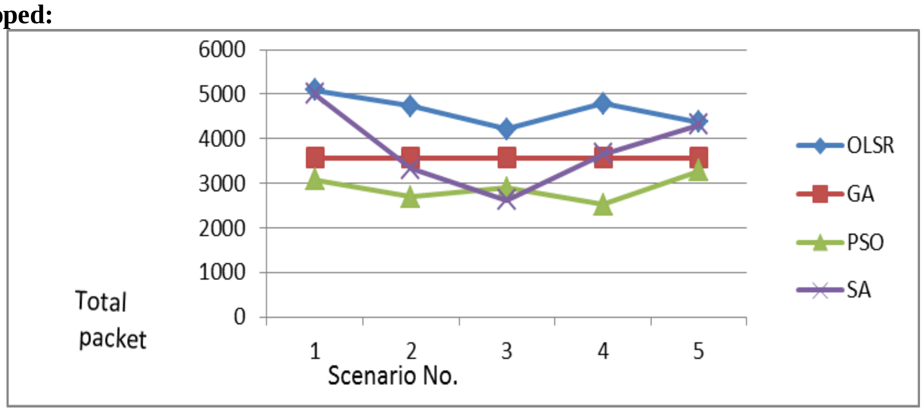

Figure1.2

Comparisons of various optimization techniques on the basis of total packet dropped

From the above figure, we can conclude that OLSR has highest packet dropped and PSO has lowest packet dropped

Packet Delay Ratio:

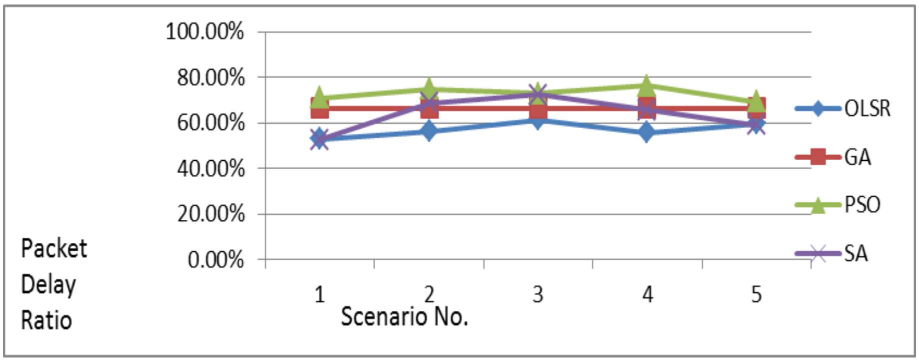

Figure1.3

Comparisons of various optimization techniques on the basis of packet delay ratio (PDR)

From the above figure, we can conclude that PSO has highest packet delay ratio and OLSR has lowest packet delay ratio.

Thoughputs:

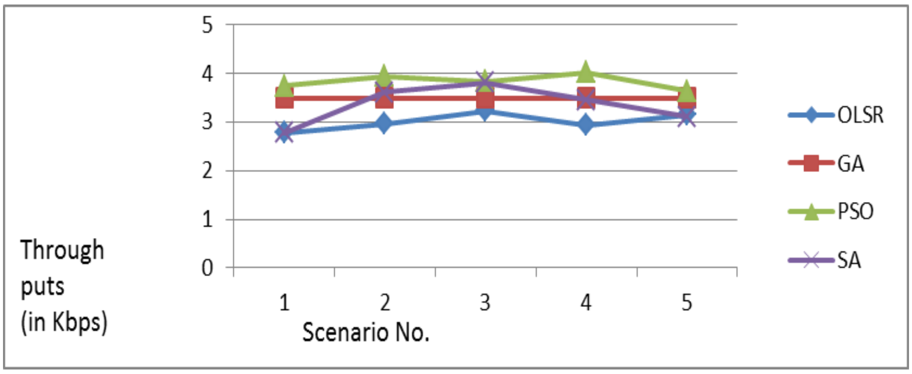

Figure1.4

Comparisons of various optimization techniques on the basis of throughputs (in Kbps)

From the above figure, we can conclude that PSO has highest throughput and OLSR has lowest throughput.

End To End Delay:

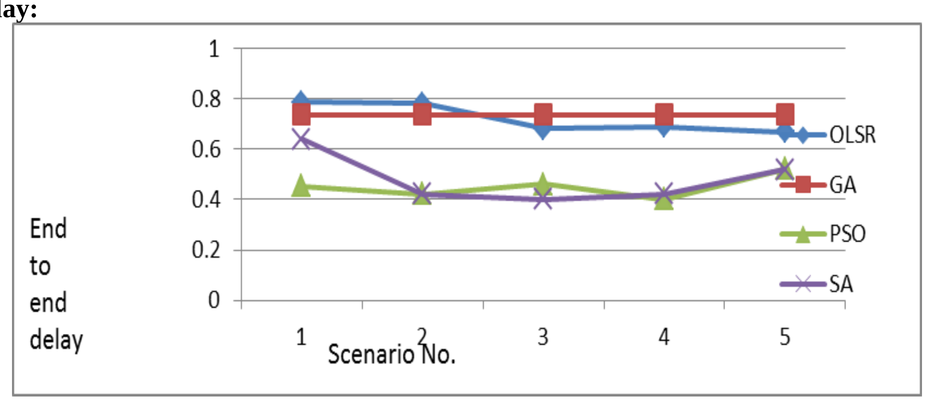

Figure1.5

Comparisons of various optimization techniques on the basis of end to end delay.

From the above figure, we can conclude that OLSR has highest end to end delay and PSO has lowest end to end delay.

V. CONCLUSION

In this thesis, we have addressed the optimal parameter tuning of the OLSR routing protocol to be used in VANETs by using an automatic optimization tool. For this purpose, we have defined an optimization strategy based on coupling optimization algorithms (GA) and the ns-2 network simulator. Also, differentiation between the optimized OLSR configurations and standard one are done. The validation of the optimized configurations that are found by comparing with each other and with the standard tuning, studying their performance in terms of QoS over VANET scenarios is done. We can conclude that in PSO ,we obtained highest packet received, throughput and PDR and lowest packet drop and end to end delay. PSO gives the best results among PSO, GA and SA for tunning of OLSR. SA gives better results than GA but lesser than PSO.

VANETs are worthy of further exploration and research, and it is believed that more applications and research results exist in the future.In the future, a main research issue of vehicular ad hoc networks focuses on designing an integrated system architecture that can make use of multiple different technologies and heterogeneous vehicular networks. Thus, developing reliable and flexible system architecture is one of the main research trends. In future our target is to further tune the performance of OLSR along with other parameters such as TC or MID values can be done.

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REFERENCES

[1] Lars Strand<lars (at) unik no>2004−04−23 “Linux Optimized Link State Routing Protocol (OLSR) IPv6 HOWTO”.

[2] Kazuyoshi Soga,TomoyaTakenaka,YoshiakiTerashima,HiroshiMineno and Tadanori Mizuno "OLSR-L: Optimized Link State Routing and Localization",2010 International Conference on Complex, Intelligent and Software Intensive Systems.

[3] Jamal Toutouh, Jos´eGarc´ıa-Nieto, and Enrique Alba,"Intelligent OLSR Routing Protocol Optimization for VANETs", IEEE TRANSACTIONS ON VEHICULAR TECHNOLOGY, IN PRESS, 2012.

[4] H. Hartenstein and K. Laberteaux, VANET Vehicular Applications and Inter Networking Technologies, ser. Intelligent Transport Systems. Upper Saddle River, NJ, USA: John Wiley & Sons, December 2009.

[5] CAMP, “Vehicle Safety Communications Consortium (2005). Vehicle safety communications project task 3 final report: Identify intelligent vehicle applications enabled by DSRC.” CAMP, Washington, DC, Tech. Rep., 2005, [Online]. Available: http://ntl.bts.gov/lib/29000/29500/ 29505/CAMP3scr.pdf.

[6] N. Lu, Y. Ji, F. Liu, and X. Wang, “A dedicated multi-channel MAC protocol design for VANET with adaptive broadcasting,” in WirelessCommunications and Networking Conference (WCNC), 2010 IEEE, April 2010, pp. 1 –6.

[7] T. Taleb, E. Sakhaee, A. Jamalipour, K. Hashimoto, N. Kato, and Y. Nemoto, “A stable routing protocol to support ITS services in VANET networks,” Vehicular Technology, IEEE Transactions on, vol. 56, no. 6, pp. 3337 –3347, November 2007.

[8] Sugendha , Bandana Sharma,“ Simulation and Automatic Tuning of OLSR Routing Protocol for VANETs”, Volume 5, Issue 5, MAY 2015 ISSN: 2277 128X International Journal of Advanced Research in Computer Science and Software Engineering Research Paper Available online at: www.ijarcsse.com.

[9] Neeraj Sharma, Jawahar Thakur, ” Performance analysis of AODV &GPSR routing protocol in VANET”, International Journal of Computer Science & Engineering Technology (IJCSET) ISSN : 2229-3345 Vol. 4 No. 02 Feb 2013.

[10] Victor Cabra, Francisco S. Ros, Pedro M. Ruil,” Simulation- Based Study of Routing Issues In VANET Routing Protocols”, 978-1- 4244-2517-41&09 © 2009 IEEE.

[11] PrabhakarRanjan, Kamal Kant Dhirwar,” Comparative Study of VANET and MANET Routing Protocols”, Proc. of the international Conference on Advance Computing and Communication Technology (ACCT 2011), ISBN: 978 -981-08-7932-7.

[12]. Mohammad Al-Rabayah and Robert Malaney,” A New Scalable Hybrid Routing Protocol for VANETs”, IEEE TRANSACTIONS ON VEHICULAR TECHNOLOGY, VOL. 61, NO. 6, JULY 2012.

[13] C. Perkins and E. Royer, “Ad hoc on-demand distance vector routing,” in *Proc. IEEE WMCSA*, 1999, pp. 90–100.

[14] S. Jaap, M. Bechler, and L. Wolf, “Evaluation of routing protocols for vehicular ad hoc networks in city traffic scenarios,” in *Proc. 5th Int. Conf. ITS Telecommun.*, Brest, France, 2005.

[15] V. Naumov, R. Baumann, and T. Gross, “An evaluation of intervehicle ad hoc networks based on realistic vehicular traces,” in *Proc. ACM MobiHoc*, 2006, pp. 108–119.

[16] H. Saleet, O. Basir, R. Langar, and R. Boutaba, “Region-based locationservice- management protocol for VANETs,” *IEEE Trans. Veh. Technol.*, vol. 59, no. 2, pp. 917–931, Feb. 2010.

[17] M. Gerla, X. Hong, G. Pei, "Fisheye State Routing Protocol (FSR)", IETF Internet Draft, work in progress, draft-ietfmanet- fsr-03.txt, July 2002.

[18] T. Clausen, et al., “Optimized Link State Routing Protocol (OLSR)”, RFC 3626, Network Working Group, Oct. 2003.

[19] R. Ogier, et al., “Topology Dissemination Based on Reverse- Path Forwarding (TBRPF)”, RFC 3684, Network Working Group, Feb 2004.

[20] C. Perkins, E. Belding-Royer, and S. Das, “Ad Hoc On- Demand Distance Vector (AODV) Routing”, RFC 3561, Network Working Group, 2003.

[21] D. Johnson, B.D.A. Maltz, and Y.C.Hu, “The Dynamic Source Routing Protocol for Mobile Ad Hoc Networks (DSR)”, draft-ietf-manet-dsr-10.txt, 2004

[22] Z. J. Haas, “The Zone Routing Protocol (ZRP) for ad hoc networks”, Internet Draft, Nov. 1997.

[23] Uma Nagaraj, Dr. M. U. Kharat," Study of Various Routing Protocols in VANET", International Journal of Computer Science& Technology ISSN : 0976-8491(Online) | ISSN : 2229-4333(Print) IJCST Vol. 2, Issue 4, Oct . - Dec. 2011.

[24] PrabhakarRanjan, Kamal Kant Dhirwar," Comparative Study of VANET and MANET Routing Protocols", Proc. of the international Conference on Advance Computing and Communication Technology (ACCT 2011), ISBN: 978 -981-08-7932-7.

[25] Kumar, R. and M. Dave, A Review of Various VANET Data Dissemination Protocols. International Journal of U-& E-Service, Science & Technology, 2012.5(3).

[26] Sharef, B.T., et al. A comparison of various vehicular ad hoc routing protocols based on communication environments. in Proceedings of the 7th International Conference on Ubiquitous Information Management and Communication. 2013: ACM.

[27] ShivaniRana,"A Review of Various Routing Protocols in VANET",International Journal of Computer Applications (0975 – 8887)Volume 96– No.18, June 2014.

[28] Yang Cheng Huang,SaleemBhatti"TUNING OLSR" The 17th Annual IEEE International Symposium on Personal, Indoor and Mobile Radio Communication (PIMRC'06).

[29] Venkaiahnaidu.A, B.RameshBabu "A New OLSR Routing Protocol in Cognitive Wireless Mesh Networks", International Journal of Modern Engineering Research (IJMER) www.ijmer.com Vol.2, Issue.1, Jan-Feb 2012 pp-496-498 ISSN: 2249-6645.

[30] Radhika Chauhan1, NitinGoyal2 ,Rakesh Kumar, " A Review on Tuning Of OLSR Routing Protocol IN VANET", *Vol-2 Issue-2 2016 IJARIIE-ISSN (O)-2395-4396.*

[31] Er. GulshanRana, Prof. .Mahesh Kumar" OLSR Routing Protocol Optimization for VANET", Volume 5, Issue 7, July 2015 ISSN: 2277 128X International Journal of Advanced Research in Computer Science and Software Engineering Research Paper Available online at: www.ijarcsse.com