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OLSR Parameter Tunning

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Abstract*— *(OLSR) Optimized link state routing is a popular protocol used for optimize the networks. OLSR perform under various scenarios (varying node density and node speed). Based on the simulate NS2 technique which reduce overhead of control messages that improve the performance of OLSR. OLSR are also use in VANET vehicular ad-hoc network. The primary purpose of this paper is to optimize VANET to improve packet delivery as well as to improve vehicular traffic flow. A series of representative algorithms (PSO, DE, GA, and SA) are used to automatically optimization.

Keywords*— *Optimize link state routing protocols (OLSR),Vehicular ad-hoc network (VANET), Intelligent water drop(IWD) algorithm, Wireless multi hop network ,Genetic algorithm(GA).

I. INTRODUCTION

1.1 OLSR:

The optimized link state routing protocols send periodic "HELLO" messages to detect neighbor changes and exchange the topology information among all the nodes of the network to discover available routes in presence of node disconnection and node movement. OLSR shares some constraints with other link protocols. When there is a link or node failure, the protocols take some time to detect the failure and reestablish a consistent view of new topology. During such a transient period, the data traffic forwarded along a path with a failed link/node will be dropped.

OPTIMISE LINK STATE ROUTING PROTOCOL inherits the use of link state of algorithms, using shortest path first forwarding. It exchange topology information with other networks periodically, and every node maintains the topology of whole network. [1]

1.2 OLSR-L: Optimized Link State Routing and Localization:

In the wireless multi-hop network, the data communication and positioning protocols are important techniques that mutually 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 solution. GPS increases node hardware costs and it cannot be used indoors. Therefore, equipping all the nodes with GPS is not a practical solution. Hence, a positioning protocol is needed to obtain the position of a node autonomously without being dependent 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 require 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 obstacles 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 applications 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 existing 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].

Vehicular ad hoc networks (VANETs) have occurred as one of the finest successful commercial applications of mobile ad hoc networks. One key goal of VANET deployment is to increase road safety and transportation efficiency [8].

VANET is one of the most challenging areas due to very high and unpredictable dynamic topology and frequent disconnections. It provides safety and security in vehicular system.[9]

1.4VANET has following different features [10]:

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.

1.5VANET 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.

1.5.1 Vehicle to Vehicle ad-hoc networks: This is also known as pure ad-hoc network which allows direct vehicular communication without need of any fixed infrastructure support.

1.5.2 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.[11]

1.6 Characteristics of VANET:

- Dynamic topology- One of the most important characteristics of VANET is dynamic topology. In this nodes or vehicles move with high speed in respect 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[12].

1.7 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.

Dynamic varying network topology- In VANET, the network topology changes dynamically with high speed. Due to this

II. PAGE LAYOUT

Zheng Li, Nenghai Yu, Zili Deng in 2008 : OLSR is a routing protocol which could decrease the overhead of control messages by selecting MPRs. So, the number of MPRs is a key for the performance of OLSR. the greedy algorithm introduced 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 problem of greedy algorithm and decreasing the number of MPRs[14].

TomoyaTakenaka, Yoshiaki Terashima in 2010: Localization protocol is important for guessing node positions in a wireless multi-hop network. Routing protocols also significant for controlling paths. In previous research ,localization and routing protocols have been discuss and evaluated alone. In this paper, we propose an integrated protocol for the optimized link state routing (OLSR) and OLSR base localization (ROULA). Our protocol enables simultaneous localization and routing.[2]

Jamal Toutouh, Jos´eGarc´ıa-Nieto, and Enrique Alba in 2012: Recent improvements in wireless technologies gave rise to the emergence of vehicular ad hoc networks (VANETs). In such networks, the limited coverage of Wi Fi and the high mobility of the nodes produce frequent topology changes and network fragmentations. For these motives, and taking into account that there is no central manager entity, routing packets through the network is a challenging task. Therefore, offering an efficient routing strategy is crucial to deploy VANETs [3].

ManpreetKaur, Kunwarpal in feb 2013: Mesh Network. COLSR is the addition of OLSR Protocol. With the use of COLSR the throughput and performance are improved. COLSR provide better solution to the problem of blocking on the nodes, with surely data are transmitted. In this paper, the enhancement of OLSR which is purely different from existing OLSR, and also discuss the generation, reputed-trust mechanism along with weighting mechanism from the nodes and COLSR perform re-routing for reduce the packet dropping problem and increase throughput devoid of congestion on nodes in WMN [15].

KunalVikasPatil, 2 M.R. Dhage in june 2013: The vehicular ad hoc network (VANET) is a greater new technology. Vehicular ad hoc network (VANET) is a sub class of MANET that is mobile ad hoc networks. Vehicular ad hoc network offers wireless communication among vehicles to roadside equipments. The communication between vehicles is more important for safety and more probably for entertainment as well. The presentation of communication depends on how well the routing takes place in the network. Routing of data depends on routing protocols being used in network. The performance of routing protocols in vehicular ad hoc network (VANET) depends on different states that are the city and highway. Position built routing protocols stay superlative suited for vehicular environment.[16]

Kamlesh C. Purohit in june 2014: Vehicular Ad-hoc Network (VANET) is a self-organized network that connects vehicle and RSUs. The RSUs can detain be connect to a background network so that many other network applications and services including internet contact can be provide to the vehicle for obtaining different services by the user or driver. The considerable attention goes in this field due to the high demands of new innovations in the vehicular industry. The primary purpose of VANET is to expand public safety and save lives as well as to improve vehicular traffic flow. VANET has very dynamic topology large network size and unnatural mobility protocol. [17]

Author	Year	Reference	Parameters	Tools/ methods	Findings
Yang chenghuang	2006	1.	Two type of control MSG are used HELLO&TC. To Reduce the intervals.to improve the OLSR performance.	NS2	OLSR routing performance largely depends on the value of the HELLO intervals timer.
Zheng Li, Nenghai Yu.	2008	2	NFA is used to solve the problem of greedy algorithm by reducing the number of MPR.	NFA,greed algorithm.	number of MPR selected by NFA reduce2%~11% compare to greedy algo, and number of TC packets could be reduce by more than 7%.
Kazuyoshi Soga	2010	14	The routing overheads and the processing procedures can be efficiently integrated. the integrated protocol for OLSR simulate the localization and routing.	Wireless multi hop N/W	The overhead of OLSR-L 40% less than Straight forward integration of the two protocols. The evaluation criteria Include localization and delivery accuracy of OLSR routing.
Jamal Toutouh	2012	3	tuned OLSR configurations result in better Q o S than standard in VANET configuration.	PSO, DE, GA, and SA	optimal parameter tuning of the OLSR routing protocol used in VANET to automatically find the current sate ofthe vehical.
M.Gunasekar	2014	9.	. Intelligent Water Drops (IWD) algorithm used to optimize the parameter setting in OLSR.	IWD	Our proposed algorithm can control the overhead generated and improved packet delivery ratio.
Lokesh Kumar Laddhani, Umesh Kumar Singh	2015	18	The Hello Interval and TC is treated like an optimize problem and GA are used to solve it. The solution change the value of parameter of OLSR using OPNET Modeller 14.5 simulator	OPNET.	Performance of OLSR by optimizing the 'Hello' interval based on the type of network. to decrease the control message traffic.

III. CONCLUSIONS

In this paper we study the how we improve the performance of OLSR optimize link state routing protocols by using Hello and TC intervals messages. NFA is used to reduce the MPR [multi point relay] compare to greedy algorithms. PSO, DE, GA, and SA algorithms are used to tunning the optimal parameters of OLSR in VANET. IWD algorithm is used to improve the packet delivery ratio. Performances of OLSR optimize the Hello intervals and control the message traffics. NS2 technique is used to control the overhead used with algorithms.

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