



Survey on Energy efficiency routing algorithm using OLSR protocol in MANET

Bhavita¹

P.G. Student, Department of Computer Engineering, Atmiya Institute of technology and science College, Rajkot, Gujarat, India¹

ABSTRACT: Mobile Ad Hoc Network (MANET) is the collection of node in which devices can communicate with each other through a wireless medium. As MANET is a wireless network without any fixed structure they have many issues and one of the issue is energy efficiency. Energy-efficient MANET routing protocol OLSR is widely used for routing in ad hoc networks. Now a day's people are working on mobile devices more and this increases power loss more and more. There are many papers in which they have tried to reduce the power loss with different technique. This paper provides a survey of energy efficiency using OLSR protocol.

KEYWORDS: OLSR protocol, MANET, energy efficiency, MPR mechanism, Hierarchical routing

I. INTRODUCTION

From last few years' wireless networks has become popular [3]. The main advantage of this is that they can free to move in any direction. These nodes can be a mobile phone, laptop, personal digital assistance, MP3 player and personal computer which can be located in cars, ships, airplanes or with people having small electronic devices [3]. In this we will take OLSR as a routing protocol in MANET for energy efficiency. Routing is the process of selecting the best available route among the available route from one node (source) to another node (destination) in any network. Routing protocols in MANETs can be classified mainly as Proactive, Reactive and Hybrid, based on their mode of functioning, basis of gathering information and type of target applications [1]. Optimized Link State Routing (OLSR) is a table driven proactive routing protocol for MANET[2]. It is an optimization of link-state routing.

Many protocols are developed for the MANET like OLSR, AODV, DSR etc. This protocols are used to update the information by routing table.

II. LITERATURE SURVEY

Ahmed Loutfi and Mohammed Elkoutbi had proposed a novel energy-aware based on clustering approach that adapted to be implemented in standard OLSR. The solution proposed in this work enables clustering for OLSR networks without causing any change in the structure of control messages.

WEN-KUANG KUO and SHU-HSIEN CHU explore EE optimization as measured in bits per Joule for MANETs based on the cross-layer design paradigm. They used the branch and bound(BB) algorithm to efficiently solve this globally optimal problem.

Nimisha Ghosh, Sanku Kumar Roy, Tuhina Samanta, Indrajit Banerjee has proposed a movement strategy for mobile sinks and thereby determined the path in which they will move throughout the lifetime of the network. This algorithm has been proved to be extremely energy saving.

Floriano De Rango, Marco Fotino, Salvatore Marano proposed a novel energy aware MPR election policy. This novel features allows energy node to be preserved for longer time. A traffic load balancing between MPR nodes has been achieved and performance improvement of OLSR in comparison with OLSR based on minimum-hop count has been obtained.

III. OLSR PROTOCOL AND ITS TECHNIQUE

The Optimized Link State Routing Protocol (OLSR) is developed for mobile ad hoc networks. It operates as a table driven, proactive protocol, i.e., exchanges topology information with other nodes of the network regularly. Each node selects a set of its neighbour nodes as "multipoint relays" (MPR). In OLSR, only nodes, selected as such MPRs, are responsible for forwarding control traffic, intended for diffusion into the entire network. MPRs provide an efficient mechanism for flooding control traffic by reducing the number of transmissions required. [7]

In this paper some of the basic technique has been given for reducing the energy loss using the OLSR protocol in MANET.

1. ENERGY EFFICIENT HIERARCHICAL ROUTING

The use of a clustering technique they minimize the consumption of energy greatly in collecting and disseminating data, it minimize energy consumption by dividing nodes into clusters [6]. In each cluster, a node with more processing power is selected as a cluster head, which aggregates the data sent by the low-powered sensor nodes [6]. The primary motive of hierarchical routing is to maintain the consumption of energy by sensor nodes as an efficient one through multi-hop communication that too in a particular cluster, by doing fusion and data aggregation to decrease the number of transmitted messages to the sink [6]. Formation of cluster is mainly based on the sensors energy reserve and proximity to the cluster head [6].

2. MTPR (Minimum Total Transmission Power Routing) and MBCR (Minimum Battery Cost Routing)

The MTPR mechanism uses a simple energy metric, represented by the total energy consumed to forward the information along the route and reduces the overall transmission power consumed per packet, but it does not affect directly the lifetime of each node. [4]

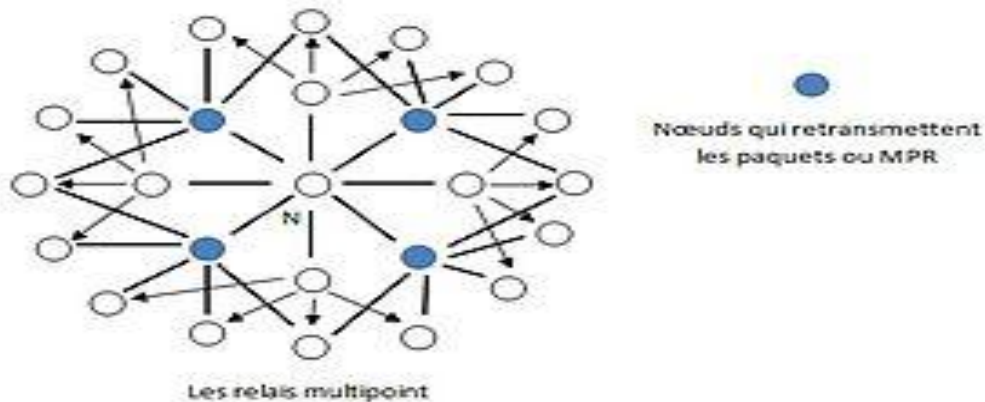
Let $c_i(t)$ be the battery capacity of node n_i at time t . We define $f_i(t)$ as a battery cost function of node n_i . The less capacity a node has, the more reluctant it is to forward packets; the proposed value is $f_i(t) = 1/c_i(t)$. The metric that minimizes this function to forward a packet is called MBCR. [4]

3. MDR (Minimum Drain Rate)

The Minimum Drain Rate (MDR) mechanism can be utilized with a cost function that takes into account the drain rate index (DR) and the residual battery power (RBP) to measure the energy dissipation rate in a given node [4]. In this mechanism, the ratio RBP_i/DR_i , at node n_i , indicates when the remaining battery of node n_i will be exhausted, i.e., how long node n_i can keep up with routing operations with current traffic conditions [4]. The corresponding cost function can be defined as: $C_i = RBP_i/DR_i$. Therefore, the maximum lifetime of a given path r_p is determined by the minimum value of c_i over the path. [4]

4. MPR Selection Mechanism

The mechanisms to select MPR nodes depend on the discriminating 1-hop neighbour nodes [5]. The discriminating is according to the three metrics: the cost regarding the residual energy on a node, the cost to the end to end transmitting, and the shortest path [5]. Their research showed that the number of active node in the networks is increased [5]. The battery capacity is divided into three levels: low, medium, and high while the predicted lifetime consists of short, medium, and long. Furthermore, the pair metrics (battery, lifetime) is associated to willingness value (default, low, and high) for MPR selection mechanism [5]. Some of the researches showed that respecting to the limited energy resource of the nodes for MPR selection mechanism can increase OLSR routing performance [5].



IV. CONCLUSION

In this paper, we have review the basic technique of the energy efficiency for MANET using the OLSR protocol. But there are also other new technique for power consumption which we can use to reduce the power dissipation.

REFERENCES

- [1] Poonam Thakur, Dr. Anita Ganpati “Cluster Based Route Discovery Technique for Routing Protocol in MANET”, Department of Computer Science, Himachal Pradesh University, INDIA, IEEE-2015
- [2] Sangeeta Asst. Professor, Kirti Singh, Sr.Lecturer “Energy Efficient Routing In MANET Using OLSR”, Dept. of Computer Science & Engineering Gurgaon Institute of Technology & Management Gurgaon,Haryana,India- ISSN : 0975-3397, Vol. 3 No. 4 Apr 2011
- [3] Ms. Monika kashap-student, Mr. Sukhvir Singh- Assistant Professor, Ms. RimpYKumari “Routing issues and challenges for MANETs: A Review”, SVIET Banur Mohali , UIET Chandigarh , International Journal of Engineering Research & Technology (IJERT), ISSN: 2278-0181, Vol. 2 Issue 10, October – 2013
- [4] Floriano De Rango, Marco Fotino, Salvatore Marano, “EE-OLSR: ENERGY EFFICIENT OLSR ROUTING PROTOCOL FOR MOBILE AD-HOC NETWORKS”, D.E.I.S. Department, University of Calabria, Via P.Bucci, Rende, Italy-IEEE (2008)
- [5] WARDI, Kouji HIRATA, Yoshinobu HIGAMI, Shin-ya KOBAYASHI, “Energy Aware MPR Selection Mechanism in OLSR-based Mobile Ad Hoc Networks”, GRADUATE SCHOOL OF SCIENCE AND ENGINEERING, EHIME UNIVERSITY-Japan, PAK vol. 56, nr 11/2010
- [6] Sudhir B. Lande, Sushil Z. Kawale, “Review on Energy Efficient Using Clustering Algorithm for Wireless Sensor Networks”, Kavikulguru Institute of Technology & Science, Ramtek, India, Volume. No. 3, Issue No. 2, July-December 2015, ISSN: 2320 – 8996
- [7] T. Clausen, Ed., P. Jacquet, Ed., “Network Working Group” ,<https://tools.ietf.org/html/rfc3626>Project Hipercom, INRIA-October 2003