INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH IN TECHNOLOGY AND SCIENCE
ISSN: 2321-1156 www.ijirts.org Volume 10 Issue 4, July 2022

A Survey on DSR Based on Link Capacity and Queue Optimization in MANET

Subhasini Sharma, Neetesh Kumar Gupta
CSED, Technocrats Institute of Technology Excellence, Bhopal, India
subhasinisharma2022@gmail.com

***Abstract*—** Wireless ad-hoc network is becoming one of the most animated and dynamic communication fields. Because the moveable devices and wireless networks have increased significantly in recent years, Mobile ad-hoc network (MANET) uses wireless connections to connect to various networks. There is a number of issues and challenges in MANET. An ad hoc network is an assortment of wireless mobile nodes dynamically forming a transitory network lacking the use of any presented network communications or centralized management. A number of routing protocols like Dynamic Source Routing (DSR), Ad Hoc on-Demand Distance Vector Routing (AODV), and Temporally Ordered Routing Algorithm (TORA) have been projected. In recent years, research on advancing the performance of mobile ad-hoc networks (MANETs) has attracted the special attention of scientists worldwide. In a dynamic network environment like MANET, routing protocols play a particularly important role in improving the overall network performance. MANETs have demonstrated outstanding capabilities and abilities in various fields serving humanity, such as healthcare, intelligent transportation systems, smart agriculture, smart retail, and IoT ecosystems. Our primary focus will be proposals for high achievable network performance and energy efficiency. In this paper, we surveyed various issues involving the QoS effect in the network with routing protocol and various performance metrics, analyzing the network's performance and increasing the MANET's performance.

***Keywords*: -** MANET, Routing, DSR, DSR-LQ, Congestion, Load, Quality of Service Routing, High Performance, Energy Efficiency.

I. INTRODUCTION

MANET is a branch of networking that deals with communication between two or more nodes without using any external devices. MANET is a continuously self-configuring, infrastructure-less network of mobile devices connected wirelessly. It is one of the types of the ad-hoc network. Here ad-hoc means whenever there is a need, devices establish the connection. MANET is a collection of nodes that are free to move in the wireless network. The nodes are responsible for forwarding the data or packets from source to destination.

Each node performs the role of both host and router. A Mobile ad hoc network (MANET) is a class of wireless networks where mobile nodes communicate with each other without any pre-existing infrastructure network and centralized control. In MANET, communications between neighbouring nodes are done directly, while the remote nodes are based on multihop wireless links. Mobile nodes in the network act as hosts and a source of data, destinations for data and forwarders of the data. Besides that, they also function as network routers that discover and maintain routes to other nodes in the network. With the use of routing protocol, nodes can communicate with other nodes in the dynamic environment of MANET. Routing in MANET is challenging in the absence of a central coordinator compared to other wireless networks where base stations or fixed routers manage routing decisions. The designing routing protocol in the ad-hoc network depends on various factors like mobility, bandwidth, resource constraints, and communication environment. Types of MANET applications and inherent characteristics make data routing quite challenging, and general-purpose ad hoc network routing protocols cannot work efficiently with it. For effective routing, the MANET protocol should provide low control overhead, effective adaption to topological changes, low packet delays, high throughput and optimized battery power utilization.

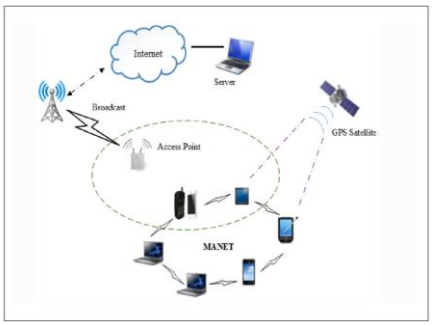

Fig1. Mobile Ad HocNetwork Architecture

The balance of all these conflicting objectives is very hard. For the optimization of the stated objectives, the Swarm intelligent-based meta-heuristics approach ACO is more promising than other algorithms in MANETs. Several routing protocols have been developed for ad hoc Mobile networks [2]. Such protocols must deal with the typical limitations of these networks, including high power consumption, low bandwidth and high error rates. Routing is the act of moving information from a source to a destination on the internetwork. Reactive routing protocols: On-demand routing protocols were designed to reduce the overheads in proactive protocols by maintaining information for active routes only. The major drawback with source routing protocols is that they do not perform well in large networks. It is due to two main reasons; firstly, as the number of intermediate nodes in each route grows, so does the probability of route failure. Secondly, as the number of intermediate nodes in each route grows, the amount of overhead

carried in each data packet header also grows. A number of different reactive routing protocols (e.g. AODV, DSR, TORA, and ZRP) have been proposed to increase the performance of reactive routing. Our focus is on DSA and AODV routing protocols which come under the category of reactive approach.

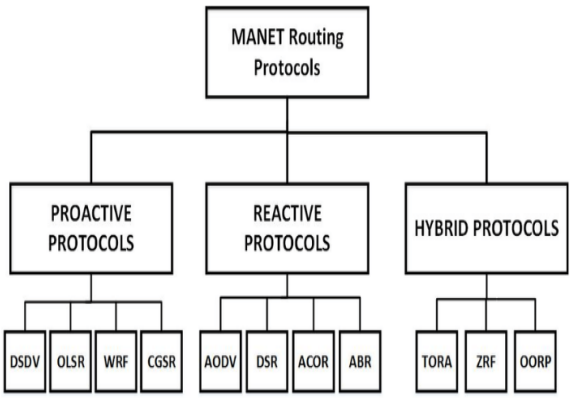

Fig2.MANETs in Routing Protocols Classifications

II. Literature Survey

Geetha Nair introduced a prediction-based Link Stability Scheme for Mobile Ad Hoc Networks in which they presented a Prediction-based Link Stability Scheme (PLSS) to strike the proper balance between path, link, neighbour node, and total mobile node stability to increase the network lifespan. The stability of neighbour nodes is accomplished in the initial phase of the system by employing mobility and route stability. The path's stability is attained in the second phase. The threshold signal strength value is used in the third phase to achieve 100% mobile node stability. We projected the network lifespan of the entire network in the fourth phase.

K.Vanaja et al. Investigated "An Analysis of Single Path AODV Vs Multipath AOMDV on Link Break Using ns-2". The primary goal of this title is to look at the environmental-based procedure when connection breakage is caused by mobility. The performance of the Single Path Reactive Routing Protocol AODV and the Multipath Reactive Routing Protocol AODV was evaluated. Using Network Simulator NS-2, quantifiable performance evaluations of packet delivery ratio, average end-to-end latency, and throughput were used to make a choice. Ming Yu et al. "Link Availability Modeling for Routing Algorithms to Reduce the Link Break Time in MANETs". In this title, they propose a new routing protocol; called link effective available time (LEAT) routing that can significantly increase link connectivity while maintaining other network performances. Solving the problem of "Route the information reliably and efficiently" is a challenge that has to be solved. LEAT is a new routing protocol. First, instead of utilizing complete localization information, provide a technique for determining the link availability time during a specific moment in history by measuring the distance between the two mobile nodes of a connection. Second, they suggest a new link cost for routing, the link available time and availability product to minimize link break time in MANETs. The routing is stated as an optimum routing problem based on the new cost, for which a heuristic solution is devised. The LEAT routing protocol significantly decreases the number of link breakages by roughly 15% and marginally boosts the delivery ratio, according to simulation data. Akbari Torkestani, et.al. "A Link Stability-based Multicast Routing Protocol for Wireless Mobile Ad hoc Networks". In this title, they proposed an algorithm called weighted multicast routing algorithm for MANET in which the mobility parameters should be a random variable with unknown distribution. In which the mobility parameters should be a random variable with unknown distribution. The multicast routing issue is first turned into a stochastic Steiner tree equivalent problem, in which the random weight associated with a communication connection equals its estimated duration time. Against host mobility, the proposed approach seeks to discover the most stable multicast route (with the longest duration). A multicast route is generated in each iteration of the proposed approach by discovering a random arrangement of the stochastic Steiner tree problem in the network topology graph. If the predicted duration time of the created multicast route is longer than the previous iterations, it is awarded; otherwise, it is punished. As the suggested method progresses, the choice probability of the best stable multicast route converges to one. Li Q, Liu C et al. Proposed "The routing protocol AODV based on link failure prediction". In this title, they investigated link failure prediction in the AODV routing protocol in the data transmission process known as AODV LFF. In large-scale Ad Hoc networks, frequent network interruptions can cause significant transmission delays and limit packet delivery rate. The author introduces the AODV LFP link failure prediction method (link failure prediction) to address these issues. This enhanced AODV routing protocol, AODV LFP, may efficiently minimize network transmission latency and increase packet delivery rate. Seema et al. presented an overview of the Quality of Service in MANET in which the author presents an idea about the quality of service in MANET, layered architecture of QoS, QoS parameters and constraints, QoS provisioning and QoS routing in MANET. CH. V. Raghavendran et al. proposed various challenges and advances in QoS Routing protocols in MANETin a survey of QoS aware routing protocols in MANET. Ankita Sharma et al. focused on AOMDV-QoS, a modification of existing AOMDV using drop minimization under MAC error control techniques like collision minimization and dynamic queue scheme. The proposed multipath QoS aware routing protocol based on AOMDV improves the network performance. Meena Rao et al. presented an AODV routing protocol with an nth backup route in case of link failure. If one of the routes fails, then another route is available. Hence thus improves performance by selecting multiple backup routes. Rajanigandha Metri and Sujata Agrawal presented a new protocol QAMR based on the ant colony optimization algorithm, which provides a plausible path from multiple data transmission paths. QoS is measured using delay, jitter, throughput, and packet loss probability metrics. Shweta Yadav et al.

presented a routing protocol based on AODV. In AODV-QoS, the quality of the AODV routing protocol has been improved to enhance the routing capability. In this method, the TTL value and dynamic threshold value establish the connection in the long route and measure the varying queue length. A. M. Mezher et al. proposed a multi-metric routing method to send videos for urban-VANETs scenarios. This protocol uses five routing metrics to select optimal routes, including trajectory, distance, density, bandwidth, and MAC layer losses. The results have indicated that this solution decreases latency and enhances the packet delivery ratio compared to traditional protocols. Q. Zhang et al. proposed a new multicast model based on genetic algorithms to guarantee QoS in MANETs. Specifically, they proposed that the new model guarantees that the duration time of a link in a multicast tree is longer than the delay time from the source node. The results have indicated that this model enhances QoS flows and delay compared to the traditional methods in MANETs scenarios.

III. CONCLUSION

There has been vast development in the field of wireless communication and MANET. This review paper evaluated various routing protocol techniques to control the congestion in MANETS. The routing protocol "AODV" provides a better packet delivery ratio, throughput and low delay than other routing protocols such as DSR, IRED, and EOAODV to control the congestion and packet. Due to the dynamic properties of MANETs, routing in these networks is considered a challenging problem. A Survey of routing metrics and protocols guides designing new routing protocols for MANETs. A number of optimization algorithms are used for routing in MANET. Diverse net-based MANET protocols are studied under various categories like Proactive, Reactive, and Hybrid protocols. Routing in MANET determines the best path for data to reach the destination in the network. The path availability and stability of routes at an instance is an issue in MANET that affects the quality of service in the network. This survey provides a classification of routing protocols and various ways to improve the QoS metrics such as Delay, Energy, Bandwidth, and Throughput estimation for various routing protocols in MANET. To evaluate the QoS-ADRP protocol, we set up several simulation scenarios under different changes in terms of the velocity of the mobile nodes. This paper benefits in identifying the main focus, i.e. the main key point involved in developing that algorithm.

REFERENCES

[1]. Geetha Nair and Dr N.J.R.Muniraj "Prediction based Link Stability Scheme for Mobile Ad Hoc Networks" IJCSI International Journal of Computer Science Issues, pages 401-408, Vol. 9, Issue 6, No 3, November 2012.

[2]. K.Vanaja and Dr R. Umarani "An Analysis of Single Path AODV Vs Multipath AOMDV on Link Break Using ns-2" International Journal of Electronics and Computer Science Engineering (IJECSE), pages 1080-1086, Vol. 1, No. 3, 2011.

[3]. Ming Yu, Wei Liu, and Tian Xing "Link Availability Modeling for Routing Algorithms to Reduce the Link Break Time in MANETs", International Conference on Networking, Sensing and Control, pages 115-120, 2011.

[4]. Akbari Torkestani and Meybodi M R "A Link Stability-based Multicast Routing Protocol for Wireless Mobile Ad hoc Networks", Journal of Network and Computer Applications, pages 1429-1440, Volume 34, Issue 4, July 2011.

[5]. Qing Li, Cong Liu, and Han-hong Jiang "The routing protocol of AODV based on link failure prediction" In Signal Processing, ICSP 9th International Conference on 2008, Oct 26, Pages 1993-1996, 2008.

[6]. Seema, Yudhvir Singh, Vikas Siwach, "Quality of Service inMANET", International Journal of Innovations in Engineering and Technology (IJIET), Vol. 1, 2012.

[7]. CH. V. Raghvendran, G. Naga Satish, Challenges and advances in QoS Routing Protocols for Mobile Ad Hoc Networks, IJARCSSE volume 3, Issue 8, 2013.

[8]. Ankita Sharma, Sumit vashishtha, "Improving the QoS in MANET by Enhancing the Routing Technique of AOMDV Protocol", Springer International Publishing Switzerland, 2014.

[9]. Meena Rao, Neeta Singh, "Quality of Service Enhancement in MANET with an Efficient Routing Algorithm", IEEE, 2014.

[10]. Rajanigandha Metri, Sujata Agrawal, "Ant Colony Optimization Algorithm Based an Intelligent Protocol to Improve QoS of MANETs", IEEE, International Conference on Circuits, Systems, Communication and InformationTechnology Applications (CSCITA), 2014.

[11]. Shweta Yadav, Vivek Richhariya, "Improvement of QoS Contained by AODV Routing Protocol based on Varying Queue Length and Dynamic TTL Value in MANET", IOSR Journal of Computer Engineering (IOSRJCE), Volume 14, Issue 3, 2013.

[12]. A. M. Mezher and M. A. Igartua, "Multimedia Multimetric Map-Aware Routing Protocol to Send Video-Reporting Messages Over VANETs in Smart Cities," IEEE Transactions on Vehicular Technology, vol. 66, no. 12, pp. 10611-10625, 2017.

[13]. Q. Zhang, L. Ding and Z. Liao, "A Novel Genetic Algorithm for Stable Multicast Routing in Mobile Ad Hoc Networks," China Communications, vol. 16, no. 8, pp. 24-37, 2019. D.B. Johnson, D.A. Maltz, and J. Broch, "DSR: The Dynamic Source Routing Protocol for Multi-Hop Wireless Ad Hoc Networks", Ad Hoc Networking, pp. 139-172, 2001.

[14]. S. Lee and M. Gerla, "AODV-BR: Backup routing in ad hoc networks." Proceedings of IEEE WCNC 2000, Chicago, pages 1311-1316, September 2000.

[15]. Qing Liang et al., "A dynamic source routing protocol based on path reliability and link monitoring repair", May 27, 2021.
[16]. Salem A. Almazok and Bülent Bilgehan, "A novel dynamic source routing (DSR) protocol based on minimum execution time scheduling and moth flame optimization", EURASIP Journal on Wireless Communications and Networking (2020).
[17]. Maurya, S. K., Singh, D., & Maurya, A. K. (2022). Deceptive opinion spam detection approaches a literature survey. Applied Intelligence, 1-46.
[18]. Keshari, N., Gupta, T. S., & Singh, D. (2021, December). Particle Swarm Optimization based Task Offloading in Vehicular Edge Computing. In 2021 IEEE 18th India Council International Conference (INDICON) (pp. 1-8). IEEE.