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LITERATURE REVIEW OF DELAY AWARE ROUTING PROTOCOLS IN MOBILE AD HOC NETWORKS

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ABSTRACT
A mobile ad-hoc network (MANET) consists of mobile computing entities such as laptop and palmtop computers which communicate with each other through wireless links and without relying on a static infrastructure such as a base station or access point. Without centralized administration, a MANET is highly unpredictable due to its unstable links and resource poor as most of the nodes have limited battery power. Due to these physical limitations, nodes require the cooperation of other nodes to successfully send a message to a destination over multiple hops. In reality, this routing problem is much more complex. It is highly dependent on the environment and the topology of the network. The topology refers to the arrangement in which nodes are connected to each other. In their communications, mobile nodes also have to contend with data losses from packet collisions, electromagnetic interference, and node movement and failures, therefore routing protocols are necessary for effective multi hop communications.

KEY WORDS*:* Mobile ad-hoc network, topology

INTRODUCTION
A Mobile Ad Hoc Network (MANET) is a network consisting of a set of mobile hosts capable of communicating with each other without the assistance of base stations. MANET represent complex distributed systems that include mobile nodes that can dynamically self organize into arbitrary ad hoc network topologies, allowing people and devices to seamlessly work in areas with no preexisting communication infrastructure such as, disaster recovery environments. Peoples and vehicles can thus be internetworked in areas without a preexisting communication infrastructure or when the use of such infrastructure requires wireless extensions. In view of the fact that MANET is an autonomous system of functionality equivalent mobile nodes, which have to be able to communicate while moving without any kind of wired infrastructure. To this end, mobile nodes must work together to provide the routing services. In mobile ad hoc networks there are no dedicated routers. Each node operates as a router and transmits packets between source and destination. The node within the transmission range of the source node and is not the destination node, accepts the packet sent by the source and forwards it along the route to the destination node. A number of MANET routing protocols have been proposed in the last decade. These protocols can be classified according to the routing strategy that they follow to discover route to the destination. These protocols perform variously depending on type of traffic, number of nodes, rate of mobility, etc. Routing protocols are classified into 3 categories. Those are Proactive protocols, Reactive protocols and Hybrid protocols. Proactive protocols also known Table Driven Protocols, maintain routes to all nodes, including nodes to which no packets are sent. They adjust well to topology changes. Reactive protocols also known On Demand protocols, consider the demand for data transmission. Determine the routes between hosts only when they are needed. This can reduce routing overhead. Hybrid protocols combine both proactive and reactive protocol properties to come up with a better routing protocol for well organized packet routing. Limited resources in MANETs made a very challenging problem that is represented in designing of an efficient and reliable routing strategy. A routing strategy is required to use the limited resources efficiently while at the same time being adaptable to the changing network conditions such as: network size and traffic

density. The most well known way of finding the best path from source to destination by routing protocols is the minimum hop count or shortest path, and such a selected path not always the best path to deliver data need high QoS metrics. Thus, the routing protocol may need to offer different way or method to select the path such as on the available QoS metrics on the discovered paths. As known by definition the Quality of Service (QoS) is a set of service requirements to be met by the network while transporting a packet stream from the source to the destination. Intrinsic of-the notion of QoS is an agreement or a guarantee by the network to provide a set of measurable of prespecified service performance constraints for the user in terms of end-to-end delay, delay variance (jitter), available bandwidth, and probability of packet loss. Transferring real-time traffic over MANETs is a big challenge due to the high requirements of bandwidth, time delay, and latency for-such traffic. This requires the offering of guaranteed service quality. Many protocols and enhanced techniques for existing MANET's routing protocols have been proposed by the researchers to enhance the QoS for MANETs, some of them focused on selecting the path depending on the QoS metrics such as delay, bandwidth, and battery power, but few of them-focused on delay aware protocols. Delay aware protocol is a kind of protocols that take into account delay metric of the discovered links between source and destination in the route discovery process. This metric will be recorded inside the routing table, and it will be used to select the path that carries the lowest value of delay to use it as an active route between the source and destination instead of minimum hop count or other metrics. Selecting such paths make the stream of data and especially the real time stream better in terms of less delay for delivered data. And as mentioned above the route with minimum hop is not usually the best route in terms of QoS metrics. Delay defined as the total latency experienced by a packet to traverse the network from the source to destination. Delay over MANETs has many types such as routing delay, which is the required time to find the path from source to destination. A compression and decompression delay, which is-related to transmitting audio files. Processing delay, this occurs while the node processes the packet for transmission. Propagation delay, related to propagating bits through wireless media. End-to-end Delay, which is the total time, requires for one bit traversing from source to destination. Media Access Delay, Acknowledgment and Retransmission delay, and Delay jitter.

REVIEW OF LITERATRE:

Menchaca (2014) apply the Protocol for Routing in Interest-defined Mesh Enclaves (PRIME) for incorporated routing in MANETs. PRIME found meshes that are activated and deactivated by the presence or absence of interest in individual destination nodes and groups and confines most of the signaling overhead within regions of interest (enclaves) in such meshes. The routes created in PRIME are made known to be free of stable loops.

Kuiper and Nadjm (2011) propose a geographical routing algorithm called Location-Aware ROuting for Delay-tolerant networks (LAROD), improved with a location service, a location dissemination service which joints are revealed to suit an intermittently connected MANET. Since location dissemination takes time in intermittently connected MANETs, LAROD is intended to route packets with only partial knowledge of geographic location.

DELAY AWARE TECHNIQUE ON DSR

The same study proposed almost the same technique that they used with AODV to work on DSR. In such work the delay and energy metrics were added to the route discovery messages and this-protocol named EDDSR. Node who receives route request will search within its route cache to this destination with the specified energy and delay. If both metrics values satisfied with the values in node's route cache the packet will be forwarded else it will be discarded.-A simulation has been carried out to implement this protocol (i.e., EDDSR) and test its performance using ns 2 simulator, and some metrics also have been used to evaluate this protocol like;-packet delivery ratio, end-to-end delay, remaining energy. And the comparison for this

protocol compared to original protocol DSR has been shown in that paper. EDDSR showed that it has better performance than DSR.

DELAY AWARE TECHNIQUE ON PROACTIVE ROUTING PROTOCOLS

DELAY AWARE TECHNIQUE ON OLSR

The basic algorithm underlying routing table calculations in the Optimized Link State Routing (OLSR) protocol selects the minimum hop path between source and destination node without concern-for the link quality (e.g. delay). Authors in proposed a method of determining the quality of the-path in MANET before building the routing table in OLSR. The protocol enhanced by looking for the min hop and taking into account the links delay metric. The received delay characteristics will be recorded in routing table to be used in the selection of the suitable path. This method stated that a node after determining the average Medium Access Delay for each of its links to neighboring nodes will includes this delay in a link-state advertisement. When the nodes receive advertised media access delay that companions the link state advertisement and it has a value-less than the threshold (within the acceptance value) it will appear in the routing table when the-protocol will do its routing table computations. The nodes who determined its media access delay for its links, will convert these average delay values into length metrics, and each link consider active by-OLSR will include in its link state advertisements these delay metrics. Authors in proposed Link Quality aware Optimized Link State Routing (LQOLSR), which-is a protocol that makes route selection between source and destination based on transmission delay between nodes. Selecting such routes needs to calculate the delay using a metric that represents the transmission delay and this paper used Mobility Adaptive Transmission time (MATE) as a metric to represent delay and calculated this delay by mobility adaptive delivery rate (MAPDR) with-transmission time in IEEE 802.11b. MAPDR is a modified version of PDR method which is used to-calculate the throughput of links but the authors claimed it is not suitable for mobile networks due to the number of received probes varies after node moves to new position. The calculations provided by the authors prove the ability of this method to calculate the metrics for the new position of the node. However, the LQOLSR uses the value of MATE to choose the faster path instead of shortest path as in original OLSR. The test for this proposed protocol have been done with real implementation of-MANET testbed where the throughput and the hop count have been tested and showed that the-throughput is almost similar to each other and the authors justify that the links pair in the network-might be exist within one hop count. Overall, the average hop count in LQOLSR is larger than OLSR, and that means LQOLSR chooses paths with high quality metrics regardless the hop count. And the-tests in this paper show that QOLSR outperforms OLSR.

CONCLUSION

In this article, delay aware routing protocols for MANET have been studied. The delay on discovered links during path discovery is considered as the main metric in path selection from source to destination in delay aware routing protocols. Many papers used second metric along with delay to select the best path such as bandwidth or energy. The implemented protocols showed better performance than the modified protocols when tested using simulators. Using neural network to predict QoS metrics such as delay could give superior results. Apply delay aware when selecting routing path on other MANET's routing protocols such as LORA or-DYMO could be a good area for research. Security is a big issue in MANET's environment and Securing the proposed protocols by adding some security features could also give some robustness for this kind of protocols.

REFERENCES

1. Jiang, X., Camp, T. (2002)," A Review of Geocasting Protocols for a Mobile Ad Hoc-Network", Proceedings of the Grace Hopper Celebration (GHC), CONFERENCE.
2. Corson, M.S., Maker, J.P., Cernicione, J.H. (2014),"Internet based Mobile Ad Hoc networking", IEEE Internet Computing, pp.63-70.

3. Al-Maashri, A. and Ould-Khaoua, M. (2006), "Performance analysis of MANET routing protocols in the presence of self-similar traffic", in proceedings of the 31st IEEE Conference on Local Computer Networks, pp. 801-807, Tampa, Florida, USA.
4. Abolhasan, M., Wysocki, T., Dutkiewicz, E.,(2004)" A review of routing protocols for mobile ad hoc networks", Elsevier, Ad Hoc Networks, Volume 2, Issue 1,pp. 1-22.
5. Buruhanudeen, S., Othman, M., Othman, M., Mohd Ali, B.(2007)," Existing MANET Routing Protocols and Metrics used Towards the Efficiency and Reliability. An Overview", Proceedings of the 2007 IEEE International Conference on Telecommunications and Malaysia International-Conference on Communications, ICT-MIXCC 2007, pp. 231-236, Penang, Malaysia.
6. Kaosar, G.; Sheltami, T.R.; Mahmoud, A.S.H. (2007)," Delay and Power Efficient Voice Transmission over MANET", ICC '07. IEEE International Conference on Communications, pp.-3313 – 3318.-
7. C. E. Perkins, E. Belding-Royer (2012), "Quality of Service for Ad hoc On demand Distance Vector Routing", Mobile Ad Hoc Networking Working Group, Internet Draft.
8. C. Perkins, E. Royer, and S. Das (2010), "Ad hoc on demand distance vector (AODV) routing", Internet draft, Internet Engineering Task Force.
9. C.E. Perkins, E. Belding-Royer (2001), "Quality of Service for Ad hoc On demand Distance Vector Routing", Mobile Ad Hoc Networking Working Group.
10. Boshoff, J.N., Helberg, A.S.J. (2011)," Improving QoS for Real time Multimedia Traffic in Ad-hoc Networks with Delay Aware Multi path Routing",IEEE, Wireless Telecommunications Symposium, WTS 2008,pp: 1-8
11. Zhenqiang Ye, Srikanth V. Krishnamurthy and Satish K. Tripathi (2004)," A routing framework-for providing robustness to node failures in mobile ad hoc networks", Ad-hoc Networks, Vol. 2, Issue 1, pp 97-107.
12. Pandey A.,Bansal K.K.(2014): "Performance Evaluation of TORA Protocol Using Random Waypoint Mobility Model" International Journal of Education and Science Research Review Vol.1(2)
13. Tiwari S.P.,Kumar S.,Bansal K.K.(2014): "A Survey of Metaheuristic Algorithms for Travelling Salesman Problem " International Journal Of Engineering Research & Management Technology Vol.1(5)
14. Yadav R.K.,Bansal K.K.(2012) : "Analysis of Sliding Window Protocol for Connected Node" International Journal Of Soft Computing and Engineering(IJSCE) Vol.2(5) pp.292-294
15. Asokan, R., Natarajan, A.M(2008)," Performance evaluation of Energy and Delay Aware Quality of service (Qos) routing Protocols in Mobile Adhoc Networks" , International Journal-of Business Data Communications and Networking, Volume 4, Issue 2.
16. 13] Hakim, B., Khaldoun, A. (2007)," Quality of Service for Ad hoc Optimized Link State Quality of Service for Ad hoc Optimized Link State", INTERNET-DRAFT, draft-badis-manet-qolsr 05.txt.
17. Hakim, B., Khaldoun, A., Munaretto, A., Pujolle, A., (2003) "QoS for Ad hoc NetworkingBased on Multiple Metrics: Bandwidth and Delay", MOBILE AND WIRELESS COMMUNICATIONS NETWORKS, Proceedings of the Fifth IFIP TC6 International-Conference, Singapore, pp 15-18.
18. A. Munaretto, Hakim, B., Khaldoun, A, Pujolle, G., (2002) "A Link state QoS Routing Protocol for Ad Hoc Networks," In the proceedings of IEEE MWCN2002, Stockholm, Sweden.
19. Guo, Z., Malakooti, B. (2007)," Predictive delay metric for OLSR using neural networks", Proceedings of the 3rd international conference on Wireless internet, Austin, Texas.
20. Lee, S., Gerla, M., (2001), "Split Multipath Routing with Maximally Disjoint Paths in Ad hoc-Networks", Communications, ICC 2001. IEEE International Conference on, pp. 3201-3205,-vol.10.