

A Survey Congestion Based Routing Protocols for Better Performance of Mobile Adhoc Networks

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Abstract: A mobile unintentional network (MANET) may be an assortment of wireless mobile hosts forming a short lived network without the help of any complete infrastructure or centralized administration. Mobile Ad-hoc networks are self-organizing and self-configuring multichip wireless networks where, the structure of the network changes dynamically. This is principally because of the quality of the nodes. Nodes in these networks cooperating in an exceedingly friendly manner to participating themselves in multihop forwarding. The nodes within the network not solely act as hosts however additionally as routers that route data to/from different nodes in network. MANETs need associate efficient routing protocol that achieves the standard of service (QoS) mechanism. Routing protocol ought to be absolutely distributed; adjective to frequent topology amendment, Easy computation & maintenance, optimum and loop free route optimal use of resources, Collision ought to be minimum. MANET consider the shortest path with minimum hop count as optimum route with none thought traffic and so degrading the performance of the network so it's very essential to contemplate load equalization issue in routing mechanism. This Paper principally focuses on survey of varied load balanced Routing protocols for economic data transmission in MANETs.

Keywords: MANET, Mobile Adhoc Networks, Congestion Based Routing Protocols, QoS.

INTRODUCTION

In ad hoc networks, it's essential to use economical routing protocols that give prime quality communication. To maintain movableness, size and weight of the device this network has ton of resource constrain. The nodes in MANET have restricted bandwidth, buffer house, battery power etc. thus it's needed to distribute the traffic among the mobile host. A routing protocol in Manet ought to fairly distribute the routing tasks among the mobile host. An unbalanced traffic/load distribution results in performance degradation of the network. Because of this unbalancing nature, few nodes within the network are extremely loaded with routing duties that causes the big queue size, high packet delay, high packet loss ratio and high power consumption. This downside causes resolution of load balancing routing algorithmic program for Manet.

MANET [1, 15] consists of mobile hosts equipped with wireless communication devices. the most characteristics of MANET is, it operate without a central arranger ,Rapidly deployable, self-configuring, Multi-hop radio communication, Frequent link breakage because of mobile nodes ,Constraint resources (bandwidth, computing power, battery lifetime, etc.) and all nodes are mobile therefore topology is terribly dynamic. in order that the most challenges of routing protocol in manet is , it ought to be Fully distributed, adaptive to frequent topology modification, Easy computation & maintenance, optimum

and loop free route, optimum use of resources, It give QoS and Collision ought to be minimum.

ROUTING PROTOCOL CLASSIFICATION IN MANET

The routing protocols in Manet are classified depending on routing strategy and network structure. According to the routing strategy the routing protocols can be categorised as Table-driven and supply initiated, while depending on the network structure these are classified as flat routing, hierarchic routing and geographic position assisted routing Based on the routing strategy the routing protocols are often classified into 2 parts:

Proactive (Table driven) routing protocol: - Each and every node within the network maintains routing information to each different node within the network. Routes information is mostly kept within the routing tables and is periodically updated because the configuration changes. DSDV and WRP are the samples of proactive protocols [10, 12]

Reactive (On-Demand) routing protocol: - This protocols, don't maintain routing data or routing activity at the network nodes if there's no communication. If a node desires to send a packet to another node then this protocol searches for the route in an on-demand manner and

establishes the association in order to transmit and receive the packet. DSR [1], AODV [2] are the samples of reactive protocols. [18, 16]

Hybrid routing protocol: This is combination of best options of above 2 protocols. Node inside bound distance from the node concerned, or inside a selected geographical region, are said to be in routing zone. For routing inside zone, proactive approach and for routing on the far side the zone, a proactive routing protocol is employed. [21, 23]

CLASSIFICATION OF LOAD BALANCED ROUTING PROTOCOLS IN MANET

Chai Keong Toh et al. (2009) "Load Balanced Routing Protocols for Ad Hoc" [3], varied Load balanced ad hoc routing protocols are on-demand-based protocols; i.e. load balancing methods is combined with route discovery phase[13]. In a broader context, the term load is often taken as:

- **Channel load:** Represents the load on the channel where multiple nodes contend to access the shared media.
- **Nodal load:** Relates to a node's activity. Specifically, it refers to how busy a node is in process, computation, and so on.
- **Neighboring load:** Represents the load generated by communication activities among neighboring nodes.

Load metrics Load balanced ad-hoc routing protocols are based on different load metrics

- **Active path:** This refers to the quantity of active routing paths supported by a node. Generally, the higher the number of active routing ways, the busier the node since it is responsible for forwarding data packets from an upstream node to a downstream node.
- **Traffic size:** This refers to the traffic load present at a node and its associated neighbours (measured in bytes).
- **Packets in interface queue:** This refers to the overall number of packets buffered at both the incoming and outgoing wireless interfaces.
- **Channel access probability:** This refers to the likelihood of in access to the wireless media. It is also involving the degree of channel contention with neighboring nodes.
- **Node delay:** This refers to the delays incurred for packet queuing, processing, and in transmission.

In associativity based routing (ABR) route is chosen based on nodes having associativity states that imply periods of stability [22]. ABR defines a new metric for routing called the degree of association stability. it's free from loops, deadlock, and packet duplicates. In ABR, a route is chosen based on associativity states of nodes. During this manner, the routes selected are doubtless to be long-lasting and thus there's no need to restart frequently, leading to higher gettable throughput. Load equalisation is

used throughout the route discovery phase. A source 1st sends a broadcast query (BQ) message in search of nodes that have a route to the destination. All intermediate nodes receiving the query append their addresses and associativity ticks with their neighbours together with the route relaying load (RRL) information into the query packet. During this method the query packet incoming at the destination node contains associativity ticks and relaying load information of nodes along the route. The destination node therefore is aware of, at an appropriate time once receiving the primary BQ packet, all the potential routes and their qualities. ABR then considers acceptable routes with nodes that don't exceed the maximum allowable RRL. From among the acceptable routes, the destination node chooses the foremost stable route and sends a reply back to the source node via the route hand-picked. If multiple paths have a similar overall degree of association stability, the route with the minimum number of hops is chosen. During this method ABR avoids congested nodes. [6, 8]

CONCLUSION

In this paper we've mentioned some vital problems related to the load-balanced routing protocols for mobile ad hoc networks (MANET). Nodes in Manet have limited bandwidth, buffer house, battery power etc. So it is essential to distribute the traffic among the mobile host. There are totally different metrics used for the route choice. Load balancing algorithms are delay based mostly, traffic based mostly or hybrid based mostly. In MANET, to enhance the performance, it is very essential to balance the load. Load balancing is employed to increase throughput of the network. Additionally it's attainable to maximize nodes lifetime, packet delivery ratio, and minimize traffic jam and load unbalance, as a result, end-to-end packet delay are often reduced, and network energy consumption are often balanced.

REFERENCES

- [1] J. Broch, D. Johnson, and D. Maltz, "The Dynamic Source Protocol for Mobile Ad hoc Networks", Mobile Computing, edited by Tomasz Imielinski and Hank Korth, Kluwer Academic Publishers, 1996.
- [2] Charles E. Perkins, Elizabeth M. Belding-Royer, Samir R. Das, "Ad Hoc On-Demand Distance Vector (AODV) Routing", IETF Internet draft, Feb 2003
- [3] Chai Keong Toh, Anh-Ngoc Le and You-Ze Cho "Load Balanced Routing Protocols for Ad Hoc Mobile Wireless Networks" IEEE Communications Magazine • August 2009
- [4] Shashank Bharadwaj, Vipin Kumar, Ankit Verma "A Review of Load Balanced Routing Protocols in Mobile Adhoc Networks" "International Journal of Engineering Trends and Technology- July to Aug Issue 2011
- [5] J.-H. Song, V. Wong, and V. Leung, "Load-Aware On demand Routing (LAOR) Protocol for Mobile Ad Hoc Networks," Proc. 57th IEEE VTC-Spring, Jeju, Korea, Apr. 2003, pp. 1753-57.
- [6] M. R. Pearlman, Z. J. Hass, P. Sholander, S. S. Tabrizi, "On the impact of alternate path routing for load balancing in mobile ad-hoc networks", Proc. Of 2000 First Annual Workshop on Mobile and Ad Hoc Networking and Computing, Mobihoc 2000, Boston, MA, USA, August 2000, pp. 3-10.

- [7] S. J. Lee, M. Gerla, "Dynamic Load Aware Routing in Ad Hoc Networks", Proc. ICC 2001, Helsinki, Finland, June 2001, pp. 3206-3210.
- [8] V. Saigal, A. K. Nayak, S. K. Pradhan, and R. Mall, "Load Balanced routing in mobile ad hoc networks", Elsevier Computer Communications 27(2004), pp. 295-305.
- [9] H. Hassanein, and A. Zhou, "Load-aware destination-controlled routing for MANETs", Elsevier Computer Communications 26(2003), pp. 1551-1559.
- [10] K. Wu, J. Harms, "Load Sensitive Routing for Mobile Ad Hoc Networks", Proc. IEEE ICCCN'01, Phoenix, AZ Oct. 2001, pp. 540-546.
- [11] Dae In Choi, Jin Woo Jung, K. Y. Kwon, D. Montgomery, and HyunKook Kahng, "Design and Simulation Result of a Weighted Aware Routing(WLAR) Protocol in Mobile Ad Hoc Network", LNCS 3391, pp. 178-187, 2003.
- [12] S. Ahn, Y. Lim and J. Choe, "A Load-Balancing Approach in Ad-Hoc Networks", ICOIN 2003, LNCS 2662, pp. 672-681, 2003.
- [13] Y. Yoo and S. Ahn, "A Simple Load-Balancing Approach in Secure Ad Hoc Networks", ICOIN 2004, LNCS 3090, pp. 44-53, 2004.
- [14] J-H. Song, V. Wong, and V. Leung, "Load Aware On-Demand routing (LAOR) Protocol for Mobile Ad hoc Networks," in Proceedings of IEEE Vehicular Technology Conference (VTCSpring), Jeju, Korea, April 2003.
- [15] Kyungshik Lim, Hyun-Kook Kahng, "A Correlated Load Aware Routing Protocol in Mobile Ad Hoc Networks", ECUMN 2004, LNCS 3262, pp. 227-236, 2004.
- [16] H. K. Cho, E. S. Kim, and D-W Kang, "A Loadbalancing Routing Considering Power Conservation in Wireless Ad-Hoc Networks", Proc. Of the 16th International Workshop on Database and Expert Systems Applications, DEXA'05.
- [17] Shouyi YIN, Xiaokang LIN, "Adaptive Load Balancing in Mobile Ad hoc Networks", IEEE Communications Society /WCNC 2005, pp.1982- 1987, 2005.
- [18] Xuefei Li and Laurie Cuthbert, "On-demand Node-Disjoint Multipath Routing in Wireless Ad hoc Networks", Proceedings of the 29th Annual IEEE International Conference on Local Computer Networks (LCN'04).
- [19] Timothy X Brown, Sheetakumar Doshi, Sushant Jadhav, Daniel Henkel, Roshan-George Thekkekunel University of Colorado, Boulder, CO 80303 A Full Scale Wireless Ad Hoc Network Test Bed.
- [20] Y. J. Lee and G. F. Riley, "A Workload-Based Adaptive Load-Balancing Technique for Mobile Ad Hoc Networks", IEEE Communication Society, WCNC 2005, pp.2002-2007.
- [21] Abdulrahman H. Altalhi, Golden G. Richard, III, "Load-Balanced Routing through Virtual Paths: Highly Adaptive and Efficient Routing Scheme for Ad Hoc Wireless Networks".
- [22] CHAI-KEONG TOH "Associativity-Based Routing for Ad-Hoc Mobile Networks" Wireless Personal communications 4: 103-139, 1997. 1997 Kluwer Academic Publishers. Printed in the Netherlands.
- [23] Amjad Ali, Wang Huiqiang "Node Centric Load Balancing Routing Protocol for Mobile Ad Hoc Networks", Proceeding of International MultiConference of Engineers and Computer Scientists 2012 Vol I, March 2012, Hong Kong.
- [24] Amita RANI, Mayank DAVE2, "Load Balanced Routing Mechanisms for Mobile Ad Hoc Networks", Int. J. Communications, Network and System Sciences, 2009, 7, 627-635.

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