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A Location based Scheme for Improving Routing Performance in Decentralized Network: A survey

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ABSTRACT

In (MANET) Mobile Ad hoc Network nodes are continuously change their location. Routing protocol are uses to established connection in between sender and receiver. Nodes are freely moves in a surrounding area because of those routing protocols are flooding larger number of packets for connection establishment. Now it is needless to say that control overhead enhancement are affecting the actual performance routing but their reduction are extremely important for efficient reactive routing protocols. New route discovery is needed only when the primary paths is fail. In Multipath protocol AOMDV if the link failures in the primary path, through which major data transmission takes place, cause the source to switch to an alternate path instead of initiating another route discovery process. A new route discovery process becomes necessary only when all pre-computed paths break. This reduces both route discovery latency and routing overheads. Using location awareness through location based DREAM (Distance Routing Effect Algorithm for Mobility) protocol the nodes in network are aware about the location information of nodes. In this paper we survey some recent research based on location and multipath in decentralized network. This survey is provides the intrusion about new research in field MANET.

Keywords—AOMDV, DREAM, Routing, Mobility, MANET

INTRODUCTION

Mobile Ad-hoc Network (MANET) is group of wireless mobile processing elements are called hosts (where the user is creating their application) forming a temporary connection without in the presence of any predetermined infrastructure or centralized administration [1]. Mobile Ad hoc networks are self-organizing and self-configuring multihop wireless networks where, the structure of the network changes dynamically. The figure 1 shows the example of MANET where sender S sends data to receiver R through intermediate nodes. This is mainly due to the mobility of the nodes. Nodes in these networks utilize the same random access wireless channel, cooperating in a friendly manner to engaging themselves in multihop forwarding. The node in the network not only acts as hosts but also as routers that route data to/from other nodes in network.

From past few years the rapid popularization of mobile phones can be seen to communicate with others anytime, anywhere, get the latest information, or exchange the required information is no longer a dream, and we have gradually become an integral part of life. Military purposes, as is often considerable danger in field environment, some of the major basic communication facilities, such as base stations, may not be available, in this case, different units, or if you want to communicate between the forces, we must rely on This cannot MANET network infrastructure limitations.

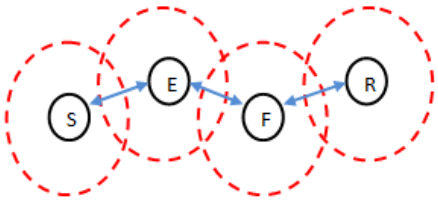

Figure 1 Example of MANET

In emergency relief, the mountain search and rescue operations at sea, or even have any infrastructure cannot be expected to comply with the topographical constraints and the pressure of time under the pressure. Routing in Mobile Ad networks has been a challenging task ever since the wireless networks came into existence. The major reason for this is the constant change in network topology because of high degree of node mobility. A number of protocols have been developed for accomplish this task. There are many routing protocols are proposed for communication at network layer. These routing protocols are completely different from the traditional wired routing protocols.

The section 2 is described the routing and types of routing protocols of MANET. The section 3 is a general overview of DREAM location protocol and the section 4 is explaining the routing procedure of AOMDV protocol. The previous work is done in field of location based routing is described in section 5 and the measurement parameters that affect the network performance are mentioned in section 6. The problem findings in multipath are described in section 7 and the expected

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proposal is mentioned in section 8. Now at lat the survey is concluded in section 9.

ROUTING PROTOCOLS IN MANET

Routing [2] is the process of selecting paths in a network along which to send network traffic. In packet switching networks, routing directs packet forwarding, the transit of logically addressed packets from their source toward their ultimate destination through intermediate nodes. An ad hoc routing protocol is a convention, or standard, that controls how nodes decide which way to route packets between computing devices in a mobile ad-hoc network. A key issue is the necessity that the Routing Protocol must be able to respond rapidly to the topological changes in the network. In these networks, each node must be capable of acting as a router. As a result of limited bandwidth of nodes, the source and destination may have to communicate via intermediate nodes [2]. Major problems in routing are Asymmetric links, Routing Overhead, Interference, and Dynamic Topology. Routing protocols are divided into two categories: Proactive, Reactive and Hybrid. Proactive routing protocols are table driven protocols and they always maintain current up-to-date routing information by sending control messages periodically between the hosts which update their routing tables. The proactive routing protocols use link-state routing algorithms which frequently flood the link information about its neighbors [2]. The reactive protocols are the protocols that are not maintaining the record of routing packets. The example of proactive routing protocols is DSDV [2] and OLSR [3]. The reactive protocols or on demand protocols are only set up a path if, they required. The routing table is created only a certain amount of time means if the connection is established and data delivery is started then only at that instant table is maintained and after connection refuse, the whole routing information is destroyed. The example of reactive on demand protocols is AODV [4] and DSR [5]. The hybrid is the combination of proactive and reactive routing protocol. The example of hybrid routing protocol is ZRP routing protocol.

The routing path selection is of two types i.e. unipath and multipath. The unipath routing protocols are discuss above. Same as the multipath routing protocol are categorized like AODV is unipath and on demand protocol but AOMDV is multipath on demand protocol. The routing procedure is same but AOMDV is able to form multiple paths. The routing classifications of multipath routing protocols are same as categorized but the particular difference is that AODV is single path but AOMDV (Ad hoc on demand Multipath Distance Vector) is the multipath routing protocol. AOMDV extends the AODV protocol to discover multiple paths between the source and the destination in every route discovery. DSR is the single path but MPDSR (Multipath Dynamic Source Routing) protocol and many more multipath routing protocols are proposed by different authors discussed in this chapter after single path routing protocols description in dynamic network.

Several routing protocols [6, 7] have been proposed for Mobile Ad hoc networks. In such protocols, nodes build and maintain routes as they are needed. Also, frequent route breaks cause the intermediate nodes to drop packets because no alternate path to the destination is available. This reduces the overall throughput and the packet delivery ratio. Moreover, in high mobility scenarios, the average end-to-end delay can be significantly high due to frequent route discoveries. Multipath protocols [8] try to improve these problems by computing and caching multiple paths obtained during a single route discovery process. The link failures in the primary path, through which data transmission is actually taking place, cause the source to switch to an alternate path instead of initiating another route discovery. A new route discovery occurs only when all pre-computed paths break.

CHARACTERISTICS OF MANET

1. MANET environment, nodes are free to join or leave the network at any point of time, resulting in a highly dynamic network environment compared to wired network [1].
2. The Asymmetric Capabilities in MANETS include transmission ranges and radios ranges which may differ. Battery life, speed of movement and processing capacity will be different at different nodes.
3. Asymmetric Responsibilities include that only some nodes may route packets in the network or some nodes may act as leaders for nearby nodes like cluster head.
4. Traffic characteristics may differ in different ad hoc networks like bit rate, timeliness constraints, reliability requirements, unicast or multicast or geocast, host-based addressing or content-based addressing or capability-based addressing.
5. MANETS may co-exist and also co-operate with an infrastructure based network.
6. Mobility patterns may be different like people sitting at an airport lounge, citywide taxi cabs, military movements and personal area networks. The performance of a mobile ad hoc network is dependent on the node mobility pattern as well as topology, data traffic patterns, and radio interference.

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7. Mobility characteristics include speed, predictability, direction of movement, pattern of movement, uniformity of mobility characteristics among different nodes.

DREAM PROTOCOL

The location information refers to the geographic coordinates that can be obtained from and by the use of the location based routing. The location based protocol specifically considered here is the Distance Routing Effect Algorithm for Mobility or DREAM [9]. The DREAM protocol can be considered proactive in the sense that a mechanism is defined for the dissemination and updating of location information. When the sender node S needs to send a message to the destination node D, it uses the location information for D to obtain D's direction, and transmits the message to all its one hop neighbors in the direction of D. The subsequent nodes repeat the same procedure until the destination node is reached. This effectively results in using a reactive approach, as individual nodes in the path determine the next hop in an on-demand manner.

AOMDV ROUTING PROTOCOL

The unipath protocols are limited in term of data delivery through alternative an alternative path. If the unipath routing procedure is changes to control the packets incoming and outgoing then in that case the actual routing procedure is affected. The multipath routing protocols are able to handle the load efficiently through provides the alternative path instantly in network in this section we describe the routing procedure of AOMDV protocol. The AOMDV (Ad hoc on demand Multi-path Distance Vector routing) [10] AOMDV extends AODV to provide multiple paths. In AOMDV each RREQ and respectively RREP established an alternative path to the source or destination. Multiple paths are maintained in routing entries in each node. The routing table entries contain a list of next hops along with corresponding hop counts for each destination. To ensure loop-free paths AOMDV introduces the 'advertised hop count' value at node i for destination d. This value represents the maximum hop-count for receiver R available at node intermediate node I. Consequently, alternate paths at node I for receiver R are accepted only with lower hop count than the 'advertised hop count' value. Node-disjointness is achieved by suppressing duplicate RREQ at intermediate nodes. .Multipath protocols try to alleviate these problems by computing and caching multiple paths obtained during a single route discovery process. The performance of these protocols tends to increase with node density; at higher node densities, a greater number of alternate paths are available. In such protocols, link failures in the primary path, through which data transmission is actually taking place, cause the source to switch to an alternate path instead of initiating another route discovery. A new route discovery occurs only when already established path is break. This approach can result in reduced delay since packets do not need to be buffered at the source when an alternate path is available. The multipath routing protocol are reduces the packets flooding and time consumption of retransmission i.e. we discuss end to end delay.

LITERATURE SURVEY

The previous work that has been done in this field is explained in this section. Here the current research is observed to find the new routing scheme in location based routing.

This paper proposes [11] a Network Coding in Ad Hoc network multipath routing protocol. It is typically proposed in order to increase the reliability of data transmission, and by applying network coding, which allows packet encoding at a relay node. We will also implement the performance difference between multipath routing based on Fresnel zone routing (FZR), and Energy aware Node Disjoint Multipath Routing (ENDMR) protocol in a factor of two of wide range of movement and communication models.

In this paper [12] an attempt is made to consolidate reported works that streamline geographical location attributes for routing in WSN. Usually, the routing schemes are formulated to address specific purposes and depending upon a particular application the elements of WSN, namely MCH, CH and motes may be stationary or mobile. It has been observed that geographical location based localization of nodes are more effective methods as it consumes less energy to convey requisite measures from many sensor nodes to a sink. When it comes to storing the measured or conveyed data, different storage policies are used and reported. In general, these storage policies can be classified into three types: local storage, external, and data centric storage.

The proposed protocol [13] is a variant of the single path AODV routing protocol. The proposed multipath routing protocol establishes node disjoint paths that have the lowest delays based on the interaction of many factors from different layers. Other delay aware MANETs routing protocols don't consider the projected contribution of the source node that is requesting a path into the total network load. The implication is that end to end delay obtained through the RREQ is not accurate any more. On the contrary of its predecessors, the proposed protocol takes into consideration the projected contribution of the source node into the computation of end to end delay. To obtain an accurate estimate of path delay, the proposed multipath routing protocol employs cross-layer

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communications across three layers; PHY, MAC and Routing layers to achieve link and channel-awareness and creates an update packet to keep the up to date status of the paths in terms of lowest delay. The performance of the proposed protocol investigated and compared against the single path AODV and multipath AOMDV protocols.

This work [14] proposed a node-disjoint location based multi-path routing protocol (Location-BMP) for mobile ad hoc networks to reduce the number of broadcast multi-path route discoveries and the average hop count per path from the source to the destination. During route discovery process, the intermediate nodes include their location information along with the distance in the Route-Request (MP-RREQ) packet. The destination node selects a set of node disjoint paths from the MP-RREQ packet received and sends a Route-Reply (MP-RREP) packet on each of the node-disjoint paths.

This work [15] proposes a novel Geographic Location Aware Adaptive Routing (GLAAR) protocol to reduce the computation and communication requirement for selection of next node (hop) for packet forwarding. Proposed protocol fetches the node location information using GPS and follows the robust, adaptive and efficient routing algorithm to ensure communication occurs with minimum no's of hops and computations GLAAR is adaptable to the moving destination whether destination node moves towards/ or away from the source node as shown using different case scenarios, thus it imparts efficiency in terms of route discovery, bandwidth utilization and resource usage. Simulation results enhance the performance analysis of GLAAR in terms of throughput and jitter tolerance for the packet transmission over the network.

In this paper [16], we considered to a very important position based routing protocol, named Greedy. In one of its kinds, named MFR, the source node or the intermediate packet forwarder node, sends packet to its closest neighbor to destination node. Using distance deciding metric in Greedy is not suitable for all conditions. If closest neighbor to destination has high speed (in comparison with source node or the intermediate packet forwarder node speed) or has very low remained battery power, then packet loss probability is increased. We can use other deciding metrics in addition to distance metric, to improve Greedy and increase its reliability. The metrics like power, velocity similarity. The proposed strategy uses combination of (tradeoff between) metrics distance-velocity similarity-power, to deciding about to which neighbor, the given packet should be forwarded. This strategy has lower lost packets average than Greedy, so it has more reliability.

In this paper [17], proposed a Location Based Opportunistic Routing Protocol (LOR), that is based on geographic routing and opportunistic forwarding when a source node wants to transmit a packet. It gets the location of the destination first and then attaches it to the packet header. Due to the destination node's movement, the multihop path may diverge from the true location of the final destination and a packet would be dropped even if it has already been delivered into the neighborhood of the destination. To deal with such issue, additional check for the destination node is introduced. At each hop, the node that forwards the packet will check its neighbor list to see whether the destination is within its transmission range. If yes, the packet will be directly forwarded to the destination.

In this paper [18], we present the design and performance evaluation of a new efficient on demand routing protocol for mobile ad-hoc networks. The purpose of this research is to develop and design a new routing algorithm called Tactical AODV that would be suitable for its intended application, namely the PCS (Positional Communication System is being developed for situational awareness) tactical network. Qualitative performance analysis is limited in indicating which ad-hoc routing philosophy and more especially which routing algorithm is best suited for a general ad hoc network application.

MEASUREMENT OF PARAMETERS

We must also consider with respect to the networking context where in a protocol performance is measured. Different network parameters that vary often according to the applications used include [1]:-

1. **Network Size**—this is the measurement taken as the number of nodes in the network.

2. **Network Connectivity**—this is the measurement of the average degree of a node, in turn gives the average number of neighbors of a node in the network.

3. **Topological Rate of Change**—this gives the measure of the speed with which a network topology keeps changing.

4. **Capacity of a Link** –This is the measure of effective link speed in bits/second, when it accounts for losses due to multiple accesses, coding, framing, etc.

5. **Unidirectional Links**—this gives the measure of the effectiveness of a protocol performance as a function of the presence of unidirectional links.

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6. **Traffic Patterns**—this gives the measure of the effectiveness of a protocol in adapting to dynamic, non-uniform or bursty traffic patterns.

7. **Mobility**—this gives the measure of the different circumstances, to find out whether the temporal and spatial topological correlation relevant to the performance of a routing protocol or not. Thereby it also helps in finding out most appropriate model for simulation of nodes mobility in a MANET.

8. **Fraction and Frequency of Sleeping Nodes**—this gives the measure of the protocol performance in the presence of sleeping and awakening nodes in the network.

PROBLEM FINDINGS

Mobile Ad Hoc network are maintained dynamic topology with random mobility by that we can't identify the location of nodes. Mostly ad hoc routing protocols are susceptible to node mobility, especially for large-scale networks. One of the main reasons is due to the pre-determination of an end-to-end route before data transmission. Owing to the constantly and even fast changing network topology, it is very difficult to maintain a deterministic route. Multipath protocols have definitely sort the problem of single path by providing alternative route in between sender and receiver. It means, if the existing route is break than in that case the alternative route is available but it is not providing the location of mobile nodes. AOMDV has more message overheads during route discovery due to increased flooding and since it is a multipath routing protocol, the destination replies to the multiple RREQs those results are in longer overhead. The overhead enhancement are increases the delivery of routing packets in network by that the data delivery are affected and end to end delay in the is also increases. The discovery and recovery procedures are also time and energy consuming. Once the path breaks, data packets will get lost or be delayed for a long time until the reconstruction of the route, causing transmission interruption. Pre-determination of an end-to-end route will be constructed before data transmission also no guarantee the data will send to destination. Without knowing location requires more time and energy to discovery and recovery the route to send data. So, there is a need for routing protocol which take advantage of location information is required for high amount of data delivery in highly dynamic mobile ad hoc networks. Expected Proposal, We design the algorithm for multipath routing protocol after that we follow next algorithm for destination location estimation, here very first we create mobile node and then set all parameter like routing protocol as AOMDV and each layer header then broadcast the routing packet, that time we check next hop information like multipath and connectivity of next neighbor node is found so we add this node into the routing table and send routing packet till the destination reach condition through above mechanism if destination found so destination node reply through routing acknowledgement packet to the source node, and after that sender node send's actual data packet to the destination. But certain time communicator and intermediate node move due to mobility nature and existing route break down so that case we apply DREAM module and minimize routing overhead of the network that also minimize delay as compare to other existing routing protocol.

CONCLUSION

In MANET nodes are forming temporary connection in between sender to destination in a dynamic environment. Considering this nature of MANETS, its environment consists of mobile platforms (e.g., a router with multiple hosts and wireless communications devices) or simply referred to as "nodes" which are free to move about arbitrarily. Location information has recently been applied to MANET protocols. Location based routing protocols have been developed for ad hoc networks and improves the routing performance. The general idea of predicting mobile nodes location information could be applied to other location services protocols. Location information has recently been applied to MANET routing protocols. Using location services to provide location information to MANET routing protocols have demonstrated performance improvements and promised dramatic scalability. The survey of current research is provides the thought of work based on location based routing with DREAM protocol and also aware about the resent research to improve the routing efficiency of protocol.

REFERENCES

[1]. C. Siva Ram Murthy and B. S. Manoj, "Ad Hoc Wireless Networks, Architectures and Protocols", Second Edition, Low price Edition, Pearson Education, 2007.

[2]. 15. Perkins C, Bhagwat P. Highly Dynamic Destination Sequenced Distance Vector Routing (DSDV) for mobile computers. ACM SIGCOMM'94 Conference on Communications Architectures, Protocols and Applications, London, U.K., pp. 234–244, October 1994.

[3]. Clausen T, Jacquet P. Optimized link state routing protocol. Request for Comments 3626, October 2003.

[4]. Perkins C, Royer E. Ad hoc on-demand distance vector routing. Proceedings of the 2nd IEEE Workshop on Mobile Computing Systems and Applications, New Orleans, LA, pp. 90–100 February 1999.

[5]. Johnson DB, Maltz DA. Dynamic source routing in ad hoc wireless networks, mobile computing. In Mobile

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Computing, Imielinski T, Korth H (Eds). Kluwer Academic Publishers: Dordrecht, pp. 153–181, 1996.

[6]. M. Tarique, K.E. Tepe, S. Adibi, S. Erfani, "Survey Of Multipath Routing Protocols for Mobile Ad Hoc Networks," Journal of Network and Computer Applications, Vol. 32, No. 6, , pp. 1125–1143, 2009.

[7]. By Saleh Ali K.Al-Omari, Putra Sumari, "An Overview of Mobile Ad hoc Network for The Existing Protocol and Application", International journal on application of graph theory in wireless ad hoc network and SN.Vol2,No.1,March 2010.

[8]. E. M. Royer, and C-K. Toh, "A Review of Current Routing Protocols for Ad-Hoc Mobile Wireless Networks", IEEE Personal Communications, April 1999, pp. 46-55

[9]. S. Basagni, I. Chlamtac, V.R. Syrotiuk, B.A. Woodward, A distance routing effect algorithm for mobility (DREAM), in: Proceedings of the ACM MOBICOM, pp. 76–84, October 1998.

[10]. M. Marina and S. Das, "On-demand Multipath Distance Vector Routing in Ad Hoc Networks", in Proceedings of the International Conference for Network Protocols (ICNP), Riverside, Nov. 2001.

[11]. Hua Chen, Hui Xu, Ting Zhang, Baolin Sun "Performance of Network Coding in Ad Hoc Network Multipath Routing Protocol" IEEE 2nd International Conference on Consumer Electronics, Communications and Networks (CECNet), pp. 1960 – 1964, 21-23 April 2012.

[12]. Pramod Kumar, Ashvini Chaturvedi, M. Kulkarni, "Geographical Location Based Hierarchical Routing Strategy for Wireless Sensor Networks", IEEE International Conference on Devices, Circuits and Systems (ICDCS), pp. 9 – 14, 15-16 March 2012.

[13]. Mu'ath Obaidat, M. A. Ali, M.S. Obaidat and Suhaib Obeidat "A Novel Multipath Routing Protocol for MANET" IEEE 7th International Conference on Wireless Communications, Networking and Mobile Computing (WiCOM), pp. 1-6, 23-25 Sept. 2011.

[14]. Indu Kashyap & R.K. Rathy "An Efficient Location based Reactive Multi-path Routing Protocol for MANET" International Journal of Computer Applications (IJCA) (Volume 40– No.9, pp. 24-29, February 2012.

[15]. Nisha Arora, Ajay Jangra "GLAAR: Geographic Location Aware Adaptive Routing in Mobile Ad Hoc Networks (MANETs)" International Journal of Computer Applications (0975 – 8887) Volume 50– No.22, July 2012.

[16]. Mahboobeh Abdoos, Karim Faez, and Masoud Sabaei "Position Based Routing Protocol with More Reliability in Mobile Ad Hoc Network" World Academy of Science, Engineering and Technology, pp. 304-307, 2009.

[17]. Jubin Sebastian E , Sreeraj V.R, Tauheed Ul Islam," Location Based Opportunistic Routing Protocol for Mobile Ad Hoc Networks", American Journal of Engineering Research (AJER), Volume-01, Issue-01, pp-16-21, 2012.

[18]. Mueen Uddin1, Azizah Abdul Rahman, Abdulrahman Alarifi Muhammad Talha, Asadullah Shah, Mohsin Iftikhar and Albert Zomaya, " Improving Performance Of Mobile Ad Hoc Networks using Efficient Tactical On Demand Distance Vector (TAOMDV) Routing Algorithm ", International Journal of Innovative Computing, Information and Control ICIC International, Volume 8, Number 6, pp. 4375-4389, June 2012.