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Efficient Flooding Mechanism for Routing In MANET: A Survey

KEYWORDS: MANETs, AODV, flooding

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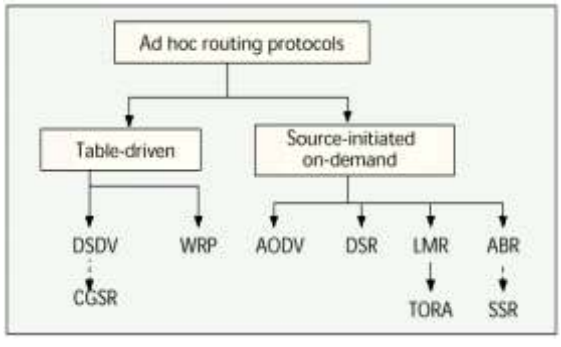
ABSTRACT In mobile ad hoc networks (MANET), dissemination is broadly used in route detection and many other network services. Mobile ad hoc networks (MANETs) are self-organizing mobile wireless networks that do not rely on a previous infrastructure to communicate. Here I do the less number of route request and best path selection strategy is proposed. Through this strategy like Energy Consumption, Fast Communication, Collision and contention control, Maximum Utilization of Bandwidth. Using AODV (Ad Hoc On-demand Distance Vector) Routing Protocols.

I. Introduction

Mobile ad hoc network is a very superior kind of wireless network environment. It is different from the traditional wireless networks. MANET consists of heterogeneous mobile devices like Notebook, cell phone, hand-hold device etc. Each device is a mobile node (MN). In MANET, an infrastructure network is not necessity. If two mobile nodes are in each other's radio range, they can send messages. Packets can be relayed by intermediary nodes; hence, MANET is very suitable and flexible. The topology of MANET can be easily deployed with few limitations [1]. Technologies and protocols for ad hoc networks. Through the past few years novel solutions for MAC/PHY layers have been required in the wireless ad hoc networking field. Regardless of the many proposals available, very few have made it to the market. Currently almost every ad hoc network trusts on IEEE 802.11 technology, which defines both physical and MAC layers. A routing protocol is essential when a packet must go through several hops to reach its destination. It is responsible for finding a route for the packet and making sure it is forwarded through the appropriate
Path [2].Internet routing protocols based on these techniques generate periodic control messages, a process that is not adequate for a large mobile network with long routes since it would result in a large number of control messages. Reducing routing overhead is serious for mobile nodes since CPU use, as well as radio transmissions and receptions, would cause batteries to be quickly depleted. We present different routing protocol proposals for MANETs that are currently available. We have organized them into three groups: proactive, reactive and other strategies, being that the latter
holds all those that do not fall under the former two categories



While using proactive routing protocols, all the nodes sometimes exchange routing information with the goal of maintaining a consistent, restructured and whole network view. Each node uses the exchanged information to compute the costs towards all probable destinations. That way, if a destination is found, there will every time be a route available towards it. Proactive routing protocol also known as Table-driven routing protocol. The main advantage of proactive routing systems is that there is no initial delay when a route is necessary. On the other hand, these are commonly related to a greater overhead and a larger convergence time than for reactive routing techniques, mostly when mobility is high. Reactive routing does not depend, in general, of periodic exchange of routing information or route calculation. Therefore, when a route is required, the node must start a route detection process. This means that it must disseminate the route request throughout the network and wait for an answer before it can proceed to send packets to the destination. [2]. Flooding is minimal or no priori knowledge of network structure is supposed. A packet is simply broadcast to all destination, with the expectation this at least one copy of the packet will reach the intended destination [3]. Multipoint relay based dissemination schemes have been developed for efficient flooding and to decrease broadcast storm problem in Mobile Ad hoc networks. There are three types of protocols namely probability-based methods, area-based methods, and multipoint relay (MPR) methods, MPR techniques are deemed to be simple. However the original MPR technique and its different techniques proposed so far suffer from time and message complexity [4].

II. Background

They prove that approach can generate less rebroadcasts than that of the fixed value probabilistic approach , dynamic and adjusted probabilistic ,when keeping the reachability high. It also demonstrates lower broadcast latency than all the presented approaches [5]. There is a major difference between the behavior obtained in ideal situations inspired from random graphs and percolation theory and simulations undertaken in MANETs prone to packet collisions. The success rate for probabilistic flooding does not exhibit a bimodal behavior as percolation theory and random graphs would suggest [6]. A dynamic probabilistic flooding that utilizes the neighbor information like the number of child and sibling nodes. It also adopts the back-off delay scheme to avoid collisions between close neighbors. Here proposed a novel flooding algorithm that can effectively decrease the number of broadcast packets and collision [7]. Using the

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probabilistic protocol of implemented and compared with pure probabilistic flooding and simple flooding [4].CDS plays an important role in routing, dissemination and connectivity administration in MANET. Distribution algorithm for MNs in a MANET to construct a CDS, not necessarily minimum, to facilitate the route finding or the broadcasting task. Distribution algorithm is simple and efficient. In this paper introduce and analyses four types of CDS algorithm: global, quasi- global, quasi-local and local [1].

III. Limitation

The different mobility models in MANET using neighbors information. They also plan to evaluate the performance of dynamic probabilistic flooding on the dynamic source routing with different mobility models representing more realistic scenarios [5]. Nodes would dynamically adjust the probabilistic for probabilistic flooding based on local graph topology information. Modifying the nodes performance [6]. Off-line methods to find an optimal routing tree for packet broadcast , but it is proved as an NP problem [7]. A simple probabilistic based algorithm has been proposed to address the issue of broadcast storm problem with the use of flooding techniques in MANETs. Probabilistic algorithm has been simulated for static and mobile network scenarios for varying node density and the performance matched with that of simple flooding technique under the same conditions .Using the simulation results, simple probabilistic based algorithm contributes to extended network lifetime, smaller number of dead nodes with time, higher throughput and less redundant REQUEST packets for both static and mobile network scenario. The secondary issue of the network becoming partitioned depending on the pattern of dead nodes. The simple flooding techniques thus higher the number of REQUEST packets generated that will not reach the destination, making more nodes to die without fulfilling them communication. Considering the connectivity of individual nodes of this algorithm could be made to further reduce redundancy of REQUEST packets and acquire higher performance. The performance of which could be matched to the other algorithm like MPR, MPR-CDS etc [4].most of the algorithms only work for static MANET environment. but here using this algorithm is different from other works and is suitable for a dynamic MANET environment. this algorithm is simple and efficient.so the future work of this paper ,to make a more reliable and stronger virtual spine network in MANET.

IV. Flooding

The flooding is the simplest and effective technique to broadcast a packet to all nodes in a wireless sensor network How basic flooding makes all nodes transmit the packet at least once, resulting in the broadcast storm problem in a serious case, in turn network resources become severely wasted. The flooding is the most frequently used method for nodes to exchange network information or deliver routing request (RREQ) messages to destination. The basic flooding, also called as blind flooding or pure flooding, is very simple. Each node that receives a broadcast packet rebroadcasts it only if the same packet has not been received before. This is simple and tolerant to the change of topology, but the amount of traffic may be too large since all nodes must rebroadcast the same packet at least once. The problem that many duplicate packets parallelize the overall network functions is called broadcast storm problem . The broadcast storm causes severe contention and collision between nodes, resulting in the very low performance of WSNs. wasting much resource like bandwidth and power, the contention and collision are large overheads to network which uses battery as the main power. they try to suppress the rebroadcast of duplicate packets based on some basic network information as location, retransmission probability, and the number of duplicate packets received by before. In some study, the more specific information like neighbor node list is utilized to reduce the number of duplicate packets. The retransmission probability of each node is determined in the inverse proportional manner to the number of neighbor nodes [7].

V. Existing flooding techniques

Simple probabilistic based algorithm has been proposed to address the issues of broadcast storm problem with use of flooding techniques in MANET [4]. Simple flooding techniques to solve the Broadcast Storm Problem, connected dominating set are a favorite system. First, it constructs a dominating set in which only nodes in the DS can relay the broadcasting packets. The DS is called a 'CDS'. CDS plays an importance role in routing, broadcasting and connectivity administration in MANET. CDS algorithm can be classified in to four schemes: global, quasi-global, quasi-local and local. 1 Global algorithm must know the entire topology of MANET. In MANET, all MNs move at any direction. It is very difficult to know the precise topology of MANET and elect an proper node with the maximum node degree. The CDS constructed will be based on the tree structure. While the virtual spine network in the tree breaks, the MANET will be filled with redundant control packets will waste the network bandwidth.

2 Quasi-global algorithm do not require knowing the entire topology in MANET. Only need the partial topology to calculate the CDS. The quasi-global algorithm, like the global algorithm, does not support the local maintenance. The quasi-global algorithm is also based tree structure.

3 Quasi-local algorithm is a simple. The election can be the lowest id algorithm. The quasi-local algorithm is only suitable for a dense MANET. And defining an ID to every node is a difficult problem. When nodes elect their roots, the bandwidth competition and the packet collision will also created.

4 Local algorithm is only one based on local information. The local algorithm constructs a CDS, all its constructed connection are weak. On the contrary, in a dense MANET, the result of the local algorithm is very good. But the battery of the nodes in CDS will be consumed quickly [1].

Multipoint relay based broadcast schemes have been developed for efficient flooding and to decrease broadcast storm problem in Mobile Ad hoc networks. Three types of protocols namely probability –based methods, area-based methods, and multipoint relay methods. MPR techniques are deemed to be simple. MPR-CDS techniques attempt to limit the number of forwarding nodes in order to address the broadcast storm problem. But result in far more complex and time consuming processes. They are also only suitable for fixed networks. Two –phase adaptive probabilistic broadcast scheme that will aim to reduce the broadcast storm problem, computation and time complexity, and reduce route discovery time while extending the network life time [4]. Probabilistic flooding, the retransmission probability is adjusted according to the number of duplicate packets received within a period of time [7]. The rebroadcast probability would be low when the numbers of neighbor nodes are high which means host is in dense area and the probability would be high when the numbers of neighbor nodes are low which means host is in sparse area.

There are five flooding schemes in MANETs called probabilistic, counter-based, distance-based, location-based and cluster-based. When receiving a broadcast message for the first time in probabilistic solution, a host rebroadcast the message with a fixed probability P. Counter-

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based solution hinders the rebroadcast if the message has previously been received for more than C times. In the distance-based solution between the sender and the receiver is larger than a threshold D. the location-based solution rebroadcast the message if the additional coverage due to the new emission is larger than a bound A. the cluster-based solution uses a cluster selection algorithm to create the clusters and gateways [7].

VI. Conclusion and future work

The simple packet flooding without a careful decision of a controlled rebroadcasting may produce an excessive redundancy of incoming packets, a greater channel contention, and a higher collision rate. This work presented various techniques to limit the influence of the problem of broadcast storm in mobile ad hoc networks.

Many protocols used in MANETs rely on the broadcasting capability, especially when performing a route discovery process. To alleviate the broadcast storm problem various solution are already available. The most promising are the: counter-based, distance-based, and location-based schemes.

Future work combining the advantages of various earlier proposed schemes in terms of reachability and saving of rebroadcasting without the overhead of equipping all nodes.

I will also evaluate the implementation and execution cost of the bounding algorithm on standard MANET routing protocols like AODV using NS2 simulator..

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