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Review on Moderating Routing Overhead in MANETs using NCPR Method

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ABSTRACT: Mobile Ad Hoc Network (MANETs) consists of a collection of mobile nodes which can move freely. These nodes can be dynamically self-organized into arbitrary topology networks without a fixed infrastructure. MANETs are highly dynamic network because nodes may join and leave the network at any time. Due to high mobility of nodes in network there is frequent path failure and route discovery in MANET. So the NCPR (Neighbor coverage based probabilistic rebroadcast) is used for reducing routing overhead in Mobile Ad Hoc Networks. A novel rebroadcast delay is used to determine the rebroadcast order, and it obtains the more accurate additional coverage ratio by sensing neighbor coverage knowledge. A connectivity factor is defined to provide the node density adaptation for keeping the network connectivity. By combining the additional coverage ratio and connectivity factor, the rebroadcast probability is calculated. NCPR significantly reduce the routing overhead in the MANET. Once the route is selected from source to destination data is transferred in form of files between nodes.

KEYWORDS: routing overhead, MANET, NCPR, rebroadcast probability.

I. INTRODUCTION

Mobile Ad hoc Networks (MANETs) are formed by an autonomous system of mobile nodes that are connected via wireless links without using an existing network infrastructure or centralized administration. The nodes are free to move randomly and act as end points as well as routers to forward packets in a multi-hop environment where all nodes may not be within the transmission range of the source. Scenarios that might benefit from MANETs technology include rescue and emergency operations in natural or environmental disaster areas, military operations, mobile conference, and home networking. Broadcasting is a means of diffusing a message from a given source to all other nodes in the network. It is a fundamental operation in MANETs as it is extensively used in route discovery, address resolution, and many other network services in a number of routing protocols. For example, Ad hoc On Demand Distance Vector (AODV)[10], Dynamic Source Routing (DSR)[3], use broadcasting or its derivative to establish routes. Existing routing protocols typically assume a simplistic form of broadcasting widely known as flooding, in which each mobile node retransmits a broadcast packet exactly once. Despite its simplicity, it can result in high redundant retransmission, contention and collision, a phenomenon collectively referred to as the broadcast storm problem, which can greatly increase the network communication overhead. To mitigate the deleterious effects of this problem, several broadcast schemes have been suggested. These schemes are commonly divided into two categories; deterministic and probabilistic. Deterministic schemes use network topological information to build a virtual backbone that covers all the nodes in the network. In order to build a virtual backbone, nodes exchange information, typically about their immediate or two hop neighbors. However, they incur a large overhead in terms of time and message complexity for building and maintaining the backbone, especially in the presence of mobility.

II. RELATED WORK

Xin Ming Zhang [1] show that the probabilistic rebroadcast protocol based on neighbor coverage to reduce the routing overhead in MANETs. This neighbor coverage knowledge includes additional coverage ratio and connectivity factor. A new scheme is to dynamically calculate the rebroadcast delay, which is used to determine the forwarding order and more effectively exploit the neighbor coverage knowledge. Simulation results show that the proposed protocol generates less rebroadcast traffic than the flooding and some other optimized scheme in literatures. C. Perkins shows that the Ad hoc On-Demand Distance Vector (AODV) routing protocol is intended for use by mobile nodes in

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an ad hoc network. It offers quick adaptation to dynamic link conditions, low processing and memory overhead, low network utilization, and determines unicast routes to destinations within the ad hoc network. It uses destination sequence numbers to ensure loop freedom at all times, avoiding problems associated with classical distance vector protocols.

The Ad hoc On-Demand Distance Vector (AODV) algorithm enables dynamic, self-starting, multihop routing between participating mobile nodes wishing to establish and maintain an ad hoc network. AODV allows mobile nodes to obtain routes quickly for new destinations. AODV allows mobile nodes to respond to link breakages and changes in network topology in a timely manner. The destination sequence number is created by the destination to be included along with any route information it sends to requesting nodes.

A. Broadcast

Broadcasting means transmitting to the IP Limited Broadcast address, 255.255.255.255. A broadcast packet may not be blindly forwarded, but broadcasting is useful to enable dissemination of AODV messages throughout the ad hoc network.

B. Destination

An IP address to which data packets are to be transmitted, same as "destination node". A node knows it is the destination node for a typical data packet when its address appears in the appropriate field of the IP header. H AlAmri shows that new routing protocol for Ad hoc networks, called on demand Tree-based Routing Protocol (OTRP)[4]. This protocol combines the idea of hop-by-hop routing such as AODV with an efficient route discovery algorithm called Tree-based Optimized Flooding (TOF) to improve scalability of Ad hoc networks when there is no previous knowledge about the destination. To achieve this in OTRP, route discovery overheads are minimized by selectively flooding the network through a limited set of nodes, referred to as branching-nodes. In that Simulation techniques are used. The theoretical analysis and simulation results showed that OTRP out performs AODV, and it reduces overheads as number of nodes and traffic increase. The simulation results for OTRP, AODV, with different number of nodes and 30 data traffic flows. Generally, as pause time and nodes density increase the End-to- End Delay. Z. J. Haas[9] many ad hoc routing protocols are based on some variant of flooding. Despite various optimizations of flooding, many routing messages are propagated unnecessarily. We propose a gossiping-based approach, where each node forwards a message with some probability, to reduce the overhead of the routing protocols. Gossiping exhibits bimodal behavior in sufficiently large networks: in some executions, the gossip dies out quickly and hardly any node gets the message; in the remaining executions, a substantial fraction of the nodes gets the message. The fraction of executions in which most nodes get the message depends on the gossiping probability and the topology of the network. In the networks we have considered, using gossiping probability between 0.6 and 0.8 suffices to ensure that almost every node gets the message in almost every execution. For large networks, this simple gossiping protocol uses up to 35% fewer messages than flooding[5-6], with improved performance. Gossiping can also be combined with various optimizations of flooding to yield further benefits. In that Simulation techniques are used.

Simulations show that adding gossiping to AODV results in significant performance improvement, even in networks as small as 150 nodes. This result suggests that the improvement should be even more significant in larger networks. B Williams & T Camp had discussed the Network wide broadcasting in Mobile Ad Hoc Networks provides important control and route establishment functionality for a number of unicast and multicast protocols. Considering its wide use as a building block for other network layer protocols, the MANET community needs to standardize a single methodology that efficiently delivers a packet from one node to all other network nodes. Despite a considerable number of proposed broadcasting schemes, no comprehensive comparative analysis has been previously done. This method provides such analysis by classifying existing broadcasting schemes into categories and simulating a subset of each category, thus supplying a condensed but comprehensive side by side comparison. The simulations are designed to pinpoint, in each category, specific failures to network conditions that are relevant to MANETs, e.g., bandwidth congestion and dynamic topologies. The categorized broadcasting protocols into four classes: “simple flooding, probability-based methods[7], area based methods, and neighbor knowledge methods.[8]” For the above four classes of broadcasting protocols, they showed that an increase in the number of nodes in a static network will degrade the performance of the probability based and area-based methods. The rebroadcast probability[2] is composed of two parts:

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A. Additional coverage ratio, which is the ratio of the number of nodes that should be covered by a single broadcast to the total number of neighbors
B. Connectivity factor, which reflects the relationship of network connectivity and the number of neighbors of a given node.

III. Proposed Work

We propose a novel approach to calculate the rebroadcast delay. The rebroadcast delay is to determine the forwarding order. The node which has more common neighbors with the previous node has the lower delay. If this node rebroadcasts a packet, then more common neighbors will know this fact. Therefore, this rebroadcast delay enables the information that the nodes have transmitted the packet spread to more neighbors. Rebroadcast probability considers the information about the uncovered neighbors, connectivity metric and local node density to calculate the rebroadcast probability.

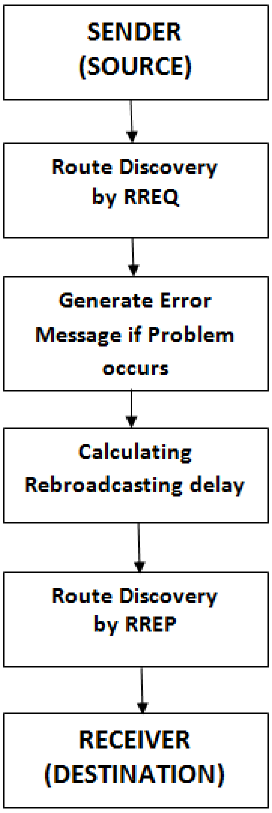

Fig.1 System Architecture

A. Objectives

- To Implementation of Route discovery by RREQ
- To Calculating Failure detection by Error
- To Calculating rebroadcasting delay
- To Implementing of Route recovery by RREQ and RREP

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B. Advantages

- Nodes have transmitted the packet spread to more neighbors
- Delay calculation is done in forwarding order
- Rebroadcast probability is also available
- Broadcasting incurs large routing overhead and causes many problems such as redundant retransmissions, contentions, and collisions.

IV. CONCLUSION AND FUTURE WORK

In this review paper we proposed to minimize the routing overhead in MANET by neighbor coverage based probabilistic rebroadcast method based on neighbor coverage knowledge which includes additional coverage ratio and connective factor. Routing overhead is the major problem in transmission of data in mobile ad hoc network. The proposed method is efficient and has good performance when the network is in high mobility or the traffic load is high. . Although the network is heavily loaded, the proposed work will perform well. This system will generate less rebroadcast traffic. Due to less redundant rebroadcast, the proposed work will overcome the network collision and contention; this will increase the packet delivery ratio and reduce the average end to end delay.

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