Energy Efficient Adaptive MULTICAST Routing Protocol for MANETS

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Abstract - MANETs have several major functions that allow MANETs to support advanced applications. Routing multicast decreases applications' connectivity expenses. There have been proposed number of MANET routing protocols. Whereas previous MANET Multi Cast protocols focussed on overhead control reduction, this multi-cast protocol has been investigated taking into account QOS limitations such as bandwidth, power with delay to reduce the quantity of unnecessary data rebroadcast. This paper focuses on network performance improvement on energy resources and proposes an Energy efficiency adaptive based Gossip protocol. For performance evaluation, End to End Time, energy consumption, and throughput are considered in this paper. I've used UDP-based traffic models to monitor the efficiency of this protocol. I evaluated the TCP model of traffic for the usual end-to - end delay. It uses the Ns-2 simulator.

Keywords: Mobile ad hoc networks, Multicasting, EMCR, MAODV, EEAGP.

I. INTRODUCTION

Mobile ad hoc networks (MANET), without a centralized coordinator, are interconnected mobile node systems. To transfer the data within the network from one node to another each mobile MANET node must be used like a router and host. One of MANET 's characteristics is its flexibility, stability, speed of use, inherent mobility and highly dynamic topology. MANETs are used according to these particular features to support specialized applications, such as military operations, civil and audio services, video conferencing and disaster circumstances. Multicasting is a data routing mechanism that facilitates communication between network groups where applications want to send the same data to multiple destinations. This suggests that multi-distribution is one of MANET's challenging issues where a certain number of targets are connected to the source node. MANET has been proposed to implement several multi-cast routing protocols. There were two groups for current multicast routing protocol: Routing protocols for mesh-based multicast [4] and multi-cast tree-based protocols [5]. A comprehensive survey of current routing algorithms for wireless MANETs was conducted in the study given in [6]-[11]. In MANETs, bandwidth is one of the main resources and coding systems (NC) of the network can be used to correctly utilize the bandwidth in the network. NC is an effective network process for encoding and decoding the transmitted data to optimize the network performance and record the entire transmission. Transmission decoding is carried out at the target node. Therefore smaller transmissions are adequate for data delivery but, in the intermediate node and target node, the great amount of processing must be performed [12]. NC improves efficiency of the network also, therefore, was seen like a trusted method. The data packets can be combined prior to transmission with intermediate nodes when NC is used. Hence, the overall data transmission number is minimized by NC and suitable for broadcast purposes. [14] Conservation of bandwidth is essential for every wireless network 's success. Whereas earlier MANET multi-cast protocols focused on reductions in overhead control, the multi-cast protocol investigated the reduction in the number of network bandwidth in terms both of overhead controls and data re-transmission. Data transmission usually takes more bandwidth than overhead control [15] [16] [18]. It can be assumed that the network performance should be significantly improved even by a small reduction in data transmission. This latest protocol aims to reduce excessive rebroadcast, as opposed to previously proposed multi-cast MANET algorithm, by considering QOS limitations such as bandwidth, power and time-out when a more powerful multi-cast tree is being created[17][19][20].

II. RELATED WORKS

In this author [21], the nodes are not static in any way about mobile ad-hoc networks. The signal strength thus varies, and during data transfer network will disconnect anytime. Each node in a multihop ad hoc mobile network must monitor continuously the received radio signals, to determine which neighbors compose a localized view of the topology of network uses routing protocols.

This author [22] provides a stable route in the mobile ad hoc networks between senders and multi-receivers for routing the data packets by multiple charge flows. If it is less secure between a sender and multiple receiver, groups like battle and disaster communications will drop vital data which never will be transferred. If the tree is always affected by mobility of the node, constructing a massive distribution tree uses resources so we must offer a solution which takes into account node mobility and often minimizes tree construction.

In this Author [23], we propose a multi-cast routing protocol based on shared trees to afford an effective, multi-source environment for multicasting. The proposed multi-path shared transmission tree maintains efficiency and stability of multi-path routing. The results of the simulations

show that the proposal protocol retains the delivery rate in multi-source multi-casts without losing multimedia efficiency. That node uses a common tree to forward multicast packets in a common multi-source routing protocol. Cost of building a shared-tree is less than a single multi-casting tree. However, the reliability of a single-source multicasting tree is lower. In this article, we propose multiple pathways to maintain robustness on the basis of the multiple shared trees.

The nodes are free for random movement and can be arbitrarily organized in this author [24], discussed on MANET. This will likely lead to group members frequently leaving / re-joining the multicast session. To solve this problem an effective dynamic multicast routing algorithm is needed urgently. Although wired networks have addressed the dynamic multicast routing extensively, MANET is scarcely researched. To fix this deficiency, we propose in this paper a Mobility Prediction (MPADMR) algorithm, aided by dynamic multicast routing.

First, in this Author [25] The RAS (Switch on the Radio) concept introduces a new Adaptive Sleep mode concept. Without alteration of the standard protocol it is set above the 802.11 MAC layer. This schedule synchronisation process is the second contribution to introduce a sleep-wake interface technique to minimize energy usage substantially because of idle listening.

III. PROPOSED WORK

A new protocol is proposed in this paper to achieve the efficacy and energy efficiency of WIFI ad hoc networks based on GSP (GOSSIP PROTOCOL). The protocol nodes can be 1-p active or sleep mode with a probability p fixed in the first phase. A control variable called B that is amount of current active neighbors, is maintained by a node. The same process is initiated at each transmission node. The other nodes are p or 1-p. The higher B the higher the node would be used for sending packets, making communications more reliable. But high energy is absorbed in the joules by the B values, so that the packets can either be received or forwarded. In order to decrease energy consumption, consequently, every node on the network starts by initializing B into one – a node originally transmits data packets to its nearest neighbour, requiring the least power. However, the intermediate nodes on the path to the active mode are activated to achieve reliability when necessary. The packet delivery ratio parameter is now calculated and compared with the threshold by feedback in the source node. Now I can now predict the shortest route based on the time the input value has arrived. The time the input factor has been obtained is T. Any paths by which the feedback factor has been obtained are registered. Carry out a T- and other observed time comparison. The deferred response path is then determined and the nodes on this path were triggered into sleep node. Intermediate nodes (through the active mode) triggered to sleep-mode after value of ratio of delivery exceeds the threshold value. For each periodic interval, the process repeats.

The other path is taken into consideration, however, because of the shortest path, which gave a slightly longer delay than the shorter path, when the packet delivery ratio does not reach the required value. Packets are transmitted via established paths. The packet distribution ratio reviews are determined now. If the threshold is above, sleep mode is activated to the nodes in the other direction that yield higher delays. The threshold is set to 0.5 in this work.

based on the RF tag technology I can create a switch that can be used to turn a radio on remotely during sleep. This allows nodes to be woken up if necessary, instead of being regularly enabled to verify that traffic is pending.

The key goal as suggested in this protocol is that more nodes be placed in sleep mode to achieve energy efficiency. A triggering signal that consumes electricity from the RF signal itself enables the sleep nodes in the path to the transmissions from packets. However, compared to existing protocols reliability, energy conservation and less delay can be achieved. And once the threshold is met, the nodes will be pushed back to sleep mode with extra power as opposed to current energy conservation schemes.

MANET performance was sensitive to mobility, scalability also traffic loading, and the various performance of protocols is evaluated, even if the number of nodes and their speed vary. The important aspect is whether the performance of the Protocols will improve depending upon size of the network, the speed of the node and traffic load. Research studies of MANET routing protocols' performance analysis have already demonstrated distinct results.

IV. RESULTS AND DISCUSSION

The EEAGP, EMCR and MAODV routing protocols performance is evaluated. The Network Simulator (NS 2.26) performs simulation results. Protocol to the EEAGP shall be compared by means of simulations with the existing protocol EMCR and MAODV. For the simulation of such routing protocols the Table 1 scenario was used.

15 nodes with application traffic are used as CBR to transmit data into 10000 bytes/0.5 ms, which is transmitted within a random topological range of 250 metres, using a two-way ground propagation model. This is the transmission rate. In the network I have used initial energy as 100J, and use MAC Protocol as 802.11, SMAC and the routing protocol as MAODV. To create the MAODV system in a routing system I have used the routing protocol.

Parameter	Value
Application Traffic	CBR
Transmission rate	10000 bytes/0.05ms
Radio range	250m
Packet size	10000 bytes
Simulation time	20 secs

Number of nodes	15
Area	1500x1500m
MAC Protocol	802.11, SMAC
Initial energy	100j
Routing Protocol	MAODV

Table1: Simulation Table

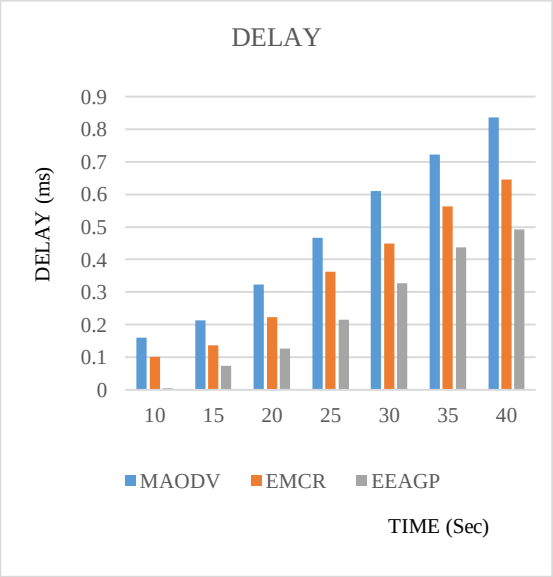

Figure 1: End-to-End Delay

This shows network delay in its end-to - end network. Toward achieve better network performance, delay in our proposed EEAGP system should be low compared with current methods such as EMCR and MAODV.

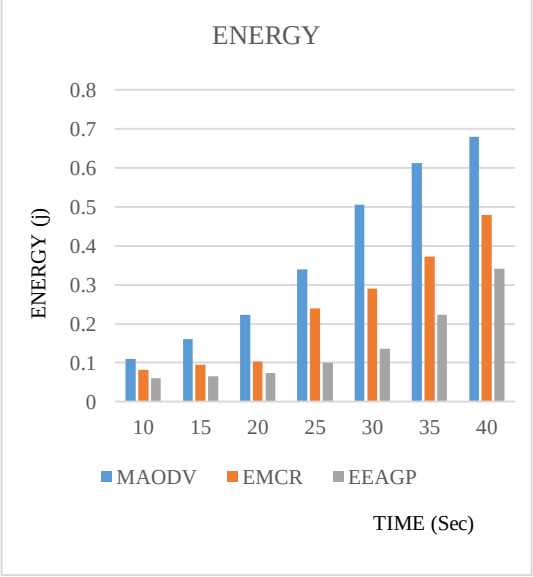

Figure 2: Energy Consumption

The figure shows the network's energy consumption. In order to achieve better network performance, our proposed EEAGP system should use low energy consumption in comparison to current methods such as EMCR, MAODV.

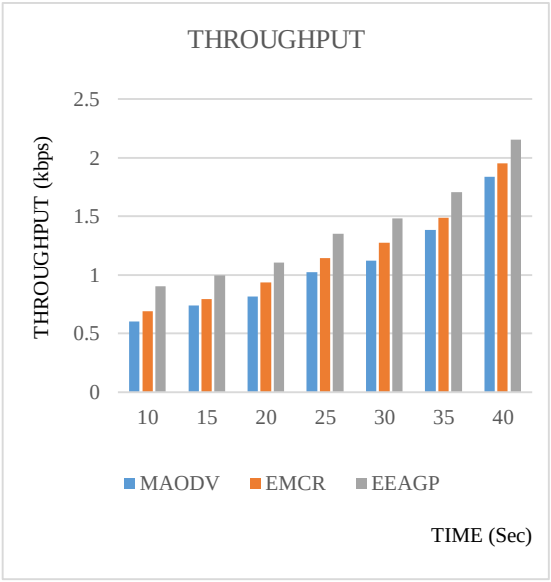

Figure 3: Throughput

It shows the network output in figure. In order to improve network performance the performance of our proposed EEAGP system should be high compared to existing methods such as EMCR and MAODV.

V. CONCLUSION

Energy efficiency adaptive based Gossip protocol is proposed here. This protocol ensures increased network performance and reduced energy efficiency for managed energy levels. Also, it is shown that the proposed protocol improves efficiency in comparison with existing methods such as EMCR and MAODV with simulation results. Also I made a plan on improving the queue to improve my work in the future. The queue stands for network data storage. To optimize the network queue routing with effective parameters, AOMDV and DSR routing protocols are used. Check for all security possibilities on the queue point at routing level.

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