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# Retransmission DBTMA Protocol with Fast Retransmission Strategy to Improve the Performance of MANETs

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**ABSTRACT** The Mobile Adhoc Networks (MANETs) are often visible to the exposed terminal problem and hidden terminal problem, which exist due to non-transitivity in Media Access Control schemes. This affects the utilization of channel and throughput in Media Access Control protocols e.g. Dual Busy Tone Multiple Access protocol (DBTMA). Hence, to improve the fairness and throughput performance of Dual Busy Tone Multiple Access protocol it is very necessary to address the problems associated with hidden and exposed terminals. Hence, in this paper, the Quality of Service is improved by enhancing the capability of Dual Busy Tone Multiple Access protocol for better network service in MANETs. The proposed method uses an improved Dual Busy Tone Multiple Access protocol called Retransmission Dual Busy Tone Multiple Access (RDBTMA) protocol. This is based on two elements namely: busy tones and Ready To Send/Clear to Send (RTS/CTS) dialogues. In addition to this fast retransmission, a strategy is used further to improve its effectiveness. The retransmission strategy is adopted using negative acknowledgement after the collision occurred by the hidden nodes. A hidden node, where the collision occurs at access point listens to the NACK signal and uses the signal to determine the requirement fast retransmission scheme. The proposed method is simulated and compared against existing methods in terms of various network parameters. The result shows that the proposed RDBTMA protocol is effective in terms of improved QoS in terms of network throughput (21.9%), packet delivery ratio (17.8%), 14.9% less packet loss and 38% less route discovery delay than the existing methods.

**INDEX TERMS** Dual Busy Tone Multiple Access protocol, Mobile Adhoc Networks, Quality of Service

## I. INTRODUCTION

The wireless adhoc multihop networks permit a limited range of wireless network devices that includes sensor nodes or mobile devices communicate with each other through remote destinations without any proper network infrastructure. The multihop network relay permits the nodes in a wireless network to carry forward the packets until it reaches the destination node. Hence, the power is conserved that compromises the overall throughput of the wireless system.

The wireless ad-hoc network performance could be understood in terms of optimizing the protocol designs. To achieve such designs, the most accurate and efficient analytical model is made essential. The multihop MANETs with random access is quite difficult to analyse, since, there

exist a random contention and hidden terminals between the nodes in the network. In recent literature, the throughput of the link in multihop MANETs is investigated through approximated models and simulations. Additionally, there exists a delay in DBTMA layers due to random contention and hidden terminals, which is not analytically studied.

If a node that is hidden outside the range of transmission of a sender, however, it lies within the receiver range is considered as hidden terminal. Since the transmission of mobile node range is limited, multiple transmitters within the same receiver range could not have known about the existence of other transmissions. In this way, the nodes are hidden from each other. The nodes transmit in/around at the same time and the real problem is that they don't recognize