ABSTRACT

The necessity of transmission with its rapid growth in a demanding natural environment, need to truthful data communication has activated the improvement in wireless ad hoc networks. The data spread in the air medium is manifested in the release of electromagnetic waves, thereby reducing the requirement of wired data communication. Wireless local area networks therefore offer the service of node mobility with all other devices in a short range. In this way of connecting wireless communication and mobile devices, the idea of being connected with anyone, any place in the world has emerged as an everyday reality.

However, a most downside in the handling of wireless networks depends on the centralized administration of predetermined wireless infrastructure. For instance in circumstances like disaster or urgent situation the predetermined infrastructure networks may not give a good service. As a result, other communication service is urgently required or a backup mode of transmission in urgent situation can be created using wired cum wireless networks so as to connect mobile ad hoc network to internet through adaptive gateway discovery systems.

The major issue in the hybrid gateway discovery is how to find out a best proactive area. While the area is large, additional overhead is sustained in preserve routes in a wider area. Alternatively, while the area is small, then less preservation overhead is sustained but extra delay results. The next issue is determines the number of GW_ADV messages that will be flooded into the MANET per second. To overcome these difficulties, a new
gateway discovery protocol, which is apt for real-time application that adjusts the frequency of gateway advertisements dynamically. The present work examines service problems on the improvement of energy consumption accessed by the gateway nodes with respect to modifying the various routing protocols like proactive, reactive and hybrid categories with quality of service parameters.

The first work is Proxied Adaptive Gateway Discovery in Hybrid MANETs using proactive and reactive protocols. It describes how an efficient discovery gateway functions for data packet transmission from mobile nodes to the Internet with the proposed algorithms dynamically adapted-its behaviour depending on the active traffic sources in MANET, which makes use of accessible local information (proxied) to further reduce the control overhead.

The second work proposes to enhance adaptive gateway discovery scheme using contention aware approach in MANET to Internet connection and find out congestion that occurs along any path to a gateway. Here, at each node measure, the four metrics value namely as Contention Value ($C_V$), Queue Value ($Q_V$), Self Value ($S_V$) and Ultimate Value ($U_V$). Thus, it can be used in determining the least congested path when multiple paths are available to reach the gateway and this information can help to optimize a network layer.

The third work proposes to Modify Adaptive gateway discovery method which dynamically changes the extent of proactive gateway advertisements. To get an up-to-date route from gateways, it is desirable to reduce the time interval. The modified adaptive gateway discovery scheme provides effective and fast discovery of gateways by the integration of three
traditional gateway discovery schemes. After finding multiple gateways, MNs should select the best internet gateway to communicate with Internet hosts outside the MANETs.

The improvement can modify and enhance the adaptive gateway discovery routing protocols with required parameters used by the nodes on a path incorporated with the existing protocols. From here the network performance can also be measured in such a way that additional network metrics like a Packets delivery ratio, Normalized routing load, Average end-to-end delay, Routing control overhead and Gateway discovery messages overhead are confronted in an efficient optimal way of hybrid MANETs.

The major focus in this research work is to analysis the performance of modified adaptive gateway discovery routing protocols for unicast and multicast data communication in the Hybrid MANETs. Consequently, the following four types of methodologies have been implemented and analysed about the performance of Hybrid MANETs.

The first methodology of Proxied Adaptive gateway discovery Based Routing in MANETs with QoS parameters where deals with the implementation of proposed Proxied Adaptive gateway discovery Based DSDV (PAB-DSDV), PAB-DSR and PAB-AODV routing protocols to choose an optimal path with adaptive gateway discovery algorithms for gateway node and mobile node on unicast data transmissions is examined. There are compared with existing protocols with respect to the network performance metrics of MANETs.

The second methodology of Contention aware Adaptive gateway discovery Based Routing in MANETs connecting Internet with QoS
parameters, deals with the implementation of proposed Contention aware Adaptive gateway discovery Based Optimized Link State Routing (CAB-OLSR), CAB-CADV and CAB-QAODV routing protocols are optimized with Contention aware metrics function on unicast data transmissions.

The third methodology of Modified Adaptive gateway discovery Based Routing in Hybrid MANETs with Unicast Data Transmission deals with the proposed Modified Adaptive gateway discovery Based Zone Routing Protocol (MAB-ZRP) which is optimized with load balance function on the MANET transmission and also evaluated and compared with existing protocol with respect to the network performance metrics of the MANETs.

This research work also highlighting on the multicast data communication. Hence the last and fourth methodology for multicast data communication deals with the implementation of the proposed hybrid routing protocol terming it is Modified Adaptive gateway discovery Based Multicast Zone Routing Protocol (MAB-MZRP) which also optimized in overhead of the Hybrid MANETs. The network performance of the proposed protocols both in unicast and multicast data transmission can meet up with the expected level thereby attaining the objectives of this research work in the hybrid MANET field. The comparative results of proposed and existing protocols have been implemented with the Network Simulator (NS2) and the enhanced results have found a place in International Journals. Thus, this research work summarizes the contribution of experimental study to enhance the MANET performance with the proposed Modified Adaptive gateway discovery Based routing method. Further, contributions and future enhancements in Adaptive gateway discovery routing related to the Hybrid MANETs have also been reported in this thesis.