CHAPTER 6

CONTRIBUTION AND ACHIEVEMENT

MANETs have been under the focus of research community since the last decade. It forms an infrastructure-less network and supports a variety of services. Initially, the use of MANETs was proposed for emergency situations like natural disasters, military conflicts and emergency medical facilities etc. Today, MANETs are required to support increasing demand for multimedia communications. Maintaining real time media traffics such as audio and video in presence of dynamic network topology is particularly challenging due to high data rate requirements and stringent delay constraints.

A MANET is a promising network technology which is based on a self organized and rapidly deployed network. Due to its great features, MANET attracts different real world application areas where the networks topology changes very quickly. However, many researchers are trying to remove main weaknesses of MANET such as limited bandwidth, battery power, computational power and security.

In MANETs, a network is formed dynamically through the cooperation of an arbitrary set of independent nodes. There is no prearrangement regarding the specific role each node should assume. Instead, each node makes its decision independently, based on the network situation, without using a pre-existing network infrastructure. Ad hoc networks have the characteristics such as dynamically changing topology, physical protection of weak nodes, the absence of centralized administration and high
dependence on inherent node cooperation. When the topology keeps changing, these networks do not have a well defined boundary and thus network based access control mechanism such as firewalls are not directly applicable.

The major concern in MANET is the conservation of energy due to the limited lifetime of mobile devices. Energy consumption at the network interface is an issue for all mobile computing devices, whether they operate within a base station infrastructure or in a free-standing mobile ad hoc network.

The high-level contribution of this work is confirmation of the hypothesis that resource utilization in ad hoc routing protocols is not fully addressed by evaluations which consider only bandwidth. Protocol performance analyses which do not take energy consumption into account may overlook problems that would hinder its practical use.

The objective of this research work mainly focuses to achieve minimum energy consumption and overhearing reduction. DBEE-CLA approach is developed for reducing the overhearing and stale route avoidance.

The Source Initiated Energy Efficient (SIEE) Scheme is developed to improve the route cache performance in the network. SIEE makes use of maximum error detection, clock based expiration of route and unconstructive caches to determine the freshness of route identification, the expiration of routes and to find the error in the link. The Efficient Source Routing Scheme (ESRS) is developed which utilizes energy consumption model considering three types of overhearing like absence of incomplete overhearing, no overhearing and absolute overhearing to make the correct balance between the energy consumption and overhearing. This Scheme uses three factors like
utility factor, mobility factor and energy factor to maintain the minimum energy consumption.

In this research work, complete information is examined in the entity to avoid the stale route information and to update the cache freshness. Compared to the existing works such as 802.11 PSM, RANDOMCAST, redundancy does not occur in ESRS and DBEE-CLA mechanism. Constant bit rate is used in traffic the source. Further it is concluded that ESRS scheme achieves more delivery ratio, less delay, less overhead and less energy consumption than the SIEE scheme as well as DBEE-CLA scheme, since it has avoided stale route and consumes less energy.