ABSTRACT

In this thesis, the trust and reputation based cooperative communication framework that ensures the node cooperation and node reputation in wireless Mobile Ad hoc Networks (MANETs) is proposed and implemented. This proposed architectural framework provides node cooperation, trust and reputations, when the packets are transmitted from the source node to destination node. These transmitted packets are sent through the intermediate relay nodes that reside between source and destination node.

This system also includes the detection of selfish and malicious nodes through various approaches proposed in this research work. The detected selfish and malicious nodes are eliminated from the communication path in order to keep the cooperative communications safe and secure. In nature, selfish node or misbehaving nodes are receive the packets from the source node and try to withheld the packets else discards the packets in order to save their energy. In MANETs, the packets does not reach the destination node due to the presence of selfish or misbehaving nodes in the network.

This proposed system identifies source node, neighboring relay nodes and destination node through the node discovery process. Once the nodes are discovered in the communication path in the network, then it is analyzed to identify the selfish nodes, malicious nodes, cooperative nodes and reputed nodes. The identification of selfish and malicious node process helps in finding the trusted communication path to transmit the packets from the source node to destination node with safe and secure.
The communication path is established and based on the number of cooperative and reputed nodes identified in the node identification process and the packets are transmitted from source nodes to destination nodes. In addition, the cooperative and reputed nodes that forward the packets without any delay are updated in the knowledge base. This knowledge base provides necessary details for the node identification for the future communication.

Moreover, this framework incorporates to include the detected selfish nodes in communication process by bargaining with necessary incentives. If the selfish nodes agree for an incentives, then they are allowed to remain in the communication path, else they are eliminated. This selfish node elimination results in increased packet delivery ratio thereby reducing the delay in packet transmission as well as reduces the packet drop ratio. Hence, the node performance as well as throughput is increased.

In addition, this framework also incorporates to reduce the energy consumed by various nodes this is achieved by providing a Network Allocation Vector (NAV) with a threshold value. If the node takes much time to forward the packets that it has received, then the NAV settings will provide an indication, so that the particular node is monitored and isolated. This process saves the energy in each node that participates in cooperative transmissions. Hence this proposed framework transmits the packet from source node to destination nodes safely in mobile ad hoc networks.