ABSTRACT

Mobile Ad Hoc Networks (MANETs) are a group of mobile nodes connected together by an ad hoc connection. They are infrastructureless, easy to deploy and the most vibrant technology where rapid research has showed immense progression. The entire work is focused on analyzing the need for QoS (Quality of Service) on a specific kind of wireless networks, the so-called ad-hoc wireless networks, the major contributions being the Confide Path Based (CPD) Scheme, the Distributive Coordination Function (DCF) and a novel routing protocol SNR&T-AODV protocol with Quality of Service in MANETs as the main direction of research.

QoS routing in an ad hoc network is difficult because the network topology changes constantly and the available state information for routing is inherently imprecise. In this research work, we propose a holistic multilayer QoS surface-guided routing which separates metrics at the different layers. In our model, each layer manages its own QoS and communicates with other layers through its QoS interface. Network layer metrics determine the quality of links in order to generate the paths with good quality. On the other hand, application layer metrics select exactly one path out of the paths that are most likely to meet the application requirements. Our model considers not only the QoS requirement, but also the cost optimality of the routing path to improve the overall network performance. Performance analysis through extensive simulations using the Network Simulator is achieved to portray the results and stand as an evidence for the same.
The existing QoS routing schemes do not consider the strength of the signal and the trustability of the mobile nodes into account. A novel metric such as SNR value and the Trust Value for route discovery phase of AODV is proposed as part of this research work. The route to reach the destination has chosen first based on the distance, available bandwidth of the link and the stability of the mobile node in the route. The link that has the highest SNR value is scheduled to take part in the route. Before that, the Trust Value is calculated for each and every node by collecting the information from the neighbour nodes. The Trust Value considers the parameters like honesty, energy, intimacy and QoS. As the node with highest trust value is scheduled as a relay node in the route, the QoS also gets improved automatically.

The CPD scheme aims to route the data packets through only good or normal nodes in the network. The nodes in the network are classified as good or bad node by using the iterative classification algorithm. For each and every route discovery to the destination, the source node initiates the execution of the iterative classification algorithm. So, the Confide based Path Discovery (CPD) scheme avoids the degradation in the QoS of MANET due to the presence of malicious node in the route to reach the destination. Path selection takes an important part to improve the performance of ad-hoc network. The ultimate goal of network is effective communication. The communication includes reliable data transmission, secure data transmission, optimal data transmission.