ABSTRACT

The transmit power level affects signal quality and thus impacts the physical layer, determines the neighboring nodes that can hear the packet and thus the network layer, affects interference which causes congestion and thus affects the transport layer. It is also key to several performance measures such as throughput, delay and energy consumption.

Power control is a mechanism that determine wireless device's transmit power level. It effects multiple OSI layer on the network i.e., physical layer, data link layer, network layer, and transport layer.The challenge is to determine where in the architecture the power control problem is to be situated, to determine the appropriate power level by studying its impact on several performance issues, to provide a solution which deals properly with the multiple effects of transmit power control.

Numerous approaches (i.e., [11], [12]) attempt to solve the power control problem at the MAC (Medium Access Control) layer. The strategy is to adjust the transmit power level of every packet such that the SNR at the intended receiver is above the threshold or just enough for decoding the packet. The claim is that this minimizes interference as well as saves energy at the wireless ad hoc network. One point to note though is that the intended receiver is determined by the network layer, i.e., by the routing table entry, and not by the MAC layer. The job of the MAC layer is only to transmit the packet to the receiver specified

by the higher layers. Thus, placing power control at the MAC layer does not give the routing protocol the opportunity to determine the optimal next hop or the intended receiver. In other words, the MAC approach to power control only does a local optimization whereas network layer power control is hoped for a global optimization.

Keyword : power control , Threshold, Medium Access Control, Ad Hoc Network.