## ABSTRACT

TCP, the Transmission Control Protocol, per se provides various congestion control mechanisms that may be used over the satellite link. However, TCP has to face with difficulties due to the satellite transmission and propagation delays. In such a network where significant losses occurred, it is difficult for TCP to respond to the required throughput or in other words, it may degrade the overall network performance.

Since achieving a required throughput is a challenging task in satellite communication, the TCP Sliding Window Algorithm that manages the flow control is developed in this research. The proposed algorithm improves TCP performance by adjusting the growth of TCP window size, rather than the advertised window, by means of data transfer size. To facilitate understanding, the proposed algorithm is broken down into two portions. GEO satellite is assumed here. Extensive simulations are performed to study how different kinds of existing TCP congestion control mechanisms behave when compared to our proposed algorithm. By varying TCP advertised window size in each algorithm, we obtain the results that prove the effectiveness of utilizing the proposed algorithm.

Traffic shaping is another alternative that this research has investigated in order to ease the problem of congestion. The traffic is shaped prior to the entrance of TCP over satellite communication system by the developing NoQ, Network of Queue. Several types of queue scheduling are assumed as well as TCP window size is changeable. The results from this study reveal that NoQ is directly causing an impact to window size as of TCP protocol over satellite. Though impressive results are obtained, the improvement varies according to the network traffic condition over the satellite communications (that is the sliding window size) and input traffic rates.