ABSTRACT

Data congestion has been increasing worldwide due to various reasons such as increased urbanization, population growth and changes in population density. Congestion increases travel time, air pollution , fuel consumption and also reduces efficiency of transportation infrastructure. Systems in mobile ad-hoc network(MANETs) are facing key challenges namely, **QUALITY OF SERVICE(QOS)** and **QUEUE MANAGEMENT** for the broadcast scheme of IEEE 802.11. Existing 1-Dimensional(1-D) Markov chain models of 802.11 systems failed to capture the accurate and complete Quality of service performance(Qos) and queuing behaviour due to lack of an adequate finite buffer model. Which led to the development of (2-D) 2-Dimensional Markov chain.The latter integrates the broadcast scheme of the 802.11 system and the queuing process into one model. The extra dimension, which models the queue length, allows to accurately capture the important Quality of service measures, delay and loss, throughput and queue length, for realistic 802.11 systems with finite buffer under finite load . Hereby a simplified method has been derived to solve steady state probability of the 2-D Marcov chain.

This method provides the solution for broadcast scheme of 802.11 by using Collision Transpose Mechanism (CTM) that are validated by extensive simulations. The analysis reveal that the lack of binary exponential backoff and retransmission in the 802.11 system results in poor Quality of service performance during heavy traffic load, particularly for large MANETs. Thus, the model demonstrated here overcomes the drawbacks of exsisting model by providing traffic control guidelines to maintain good quality of service performance for MANETs.