

# PERFORMANCE EVALUATION OF A WIRELESS LOCAL AREA NETWORK DEPLOYING REAL-TIME MULTIMEDIA TRAFFIC

Shaik Madhar Saheb<sup>1</sup>, Anup Kumar Bhattacharjee<sup>2</sup>, A. Vallavaraj<sup>1</sup>

<sup>1</sup> Caledonian College of Engineering, Sultanate of Oman Email: mazhar@caledonian.edu.om

<sup>2</sup> National Institute of Technology, Durgapur, India

## ABSTRACT

The 21<sup>st</sup> century has seen a massive proliferation of networking activities supporting the wireless media to such an extent that present wireless industry calls for extensive application of wireless networking to meet global challenges. Such an explosive deployment of wireless is not without technological challenges. This study evaluates the performance of Wireless Local Area Networks (WLANs) using real time multimedia traffic through detailed theoretical analysis, supported by rigorous simulation using the famed OPNET IT GURU tool. Although a major simulation of innumerable parameters is possible accurately, this work restricts the investigation only to the tuning and analysis of the Physical (PHY) and Medium Access Control (MAC) layer parameters. This is well supported by a critical appraisal of WLANs literature followed by technical recommendations. The effective implementation and utilization of WLAN calls for an improved degree of performance due to the fact that WLANs are inherently error prone, despite being more expensive compared to the traditional wired networks. In this investigation, an attempt is made to explore various methods for improving the WLANs performance. An extensive survey of the current literature on performance improvisation and evaluation is well supported by a critical in-depth analysis followed by ingenious recommendations and suggestions, such as tuning the IEEE 802.11 parameters.

**KEY WORDS:** CSMA/CA: Carrier Sense Multiple Access with Collision Avoidance, DSSS: Direct Sequence Spread Spectrum, FHSS : Frequency Hop Spread Spectrum, IBSS : Infrastructure Basic Service Set, MAC : Medium Access Control, OFDM: Orthogonal Frequency Division Multiplexing