

Interference mitigation for co-working wireless LANs

**G.C. Lankeshwara^{*}, W.W.M.C.R.B. Weerasekara, L.K.S.D. Liyanarachchi
S.A.H.A. Suraweera, H.M.V.R. Herath and G.M.R.I. Godaliydda**

*Department of Electrical and Electronic Engineering, Faculty of Engineering,
University of Peradeniya, Sri Lanka
^{*}glankeshwara@gmail.com*

Wi-Fi, Bluetooth and many other devices operate at the same ISM band of 2.4 GHz. The demand for those devices has increased exponentially. As a result, the number of co-located devices has increased and is a cause for interference issues. This has downgraded the network performance, resulting in low downlink and uplink speeds. This work investigated the issues regarding interference and also developed a mathematical model to predict the power level of an indoor environment. Finding the optimal location for a newly installed router where there are many other routers operating nearby, was the objective of the mathematical model. This work also discussed an implementation of router antenna tilting mechanism to mitigate the interference in an indoor environment.

An indoor environment without any effect of interference was considered as the test bed. Power measurements were obtained using InSSIDer4TM software. A ZTETM router was considered as the Access Point. A grid of 80 points of the test bed was constructed and measurements were taken at grid points by moving the laptop to those locations. The procedure was repeated for five scenarios of the location of the Access Point.

Simplified path loss model was considered as the mathematical model and its parameters were found using linear regression. This model was then used to predict the power variation inside an indoor area. The hardware implementation made sure that the receiver will have a better line of sight path. The router was rotated in steps of 10° until 60° and the variation of power level received was observed. It was noted that the tilting of router had some considerable effects on the received power level and can be used to control the interference effect.

Assistance given by Sri Lanka Telecom is acknowledged.