RECEIVED SIGNAL STRENGTH INDICATOR (RSSI) PERFORMANCE EVALUATION FOR WIMAX APPLICATION AT 2.5GHZ

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Bachelor of Electrical Engineering (Hons)

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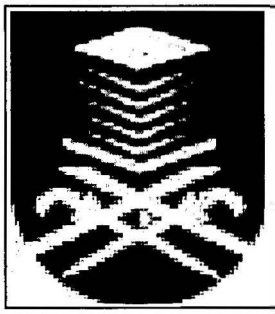

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ABSTRACT

Received signal strength indicator (RSSI)_is generic radio receiver technology metric, which is usually invisible to the user of the device containing the receiver, but is directly known to users of wireless networking of IEEE 802.11 protocol families. WiMAX or IEEE 802.16d – 2004 for fixed and IEEE 802.16e – 2005 for mobile applications is a standard based wireless technology that provides high throughput broadband connections. Owing to the offer, this bring to its most important level deployment that is radio planning. Hence this paper evaluates the received signal strength indicator (RSSI) performance for WIMAX application at 2.5GHz. This paper discussed the RSSI performance by mapping the worst case scenario using Erceg, COST231 HATA and ECC model. The 3 models were then simulated for urban, suburban and rural using Matlab 2009. It was observed that the RSSI for all the 3 models show consistency for all the three scenarios. The results were used to evaluate the best RSSI performance between the 3 models.

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CHAPTER 1

INTRODUCTION

1.1 RESEARCH BACKGROUND

In an IEEE 802.11 system RSSI is the relative received signal strength in a wireless environment, in arbitrary units. RSSI can be used internally in a wireless networking card to determine when the amount of radio energy in the channel is below a certain threshold at which point the network card is clear to send (CTS). Once the card is clear to send, a packet of information can be sent. The end-user will likely observe an RSSI value when measuring the signal strength of a wireless network through the use of a wireless network monitoring tool like Wireshark, Kismet or Inssider.RSSI measurements are unitless and in the range 0 to 255, expressible as a one-byte unsigned integer. The maximum value, RSSI_Max, is vendor dependent. For example, Cisco Systems cards have a RSSI_Max value of 100 and will report 101 different power levels, where the RSSI value is 0 to 100. Another popular Wi-Fi chipset is made by Atheros. An Atheros based card will return an RSSI value of 0 to 127 (0x7f) with 128 (0x80) indicating an invalid value.There is no specified relationship of any particular physical parameter to the RSSI reading. The 802.11 standard does not define any relationship between RSSI value and power level in mW or dBm. Vendors provide their own accuracy, granularity, and range for the actual power (measured as mW or dBm) and their range of RSSI values (from 0 to RSSI_Max).The subtlety of 802.11 RSSI comes from how it is sampled; RSSI is acquired