A STUDY OF INTERFERENCE BETWEEN BLUETOOTH AND 802.11b (WIFI)

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LAPORAN AKHIR PENYELIDIKAN "A STUDY OF INTERFER BETWEEN BLUETOOTH AND 802.11b (WIFI)"

Merujuk kepada perkara di atas, bersama-sama ini disertakan 3 Laporan Akhir Penyelidikan bertajuk "A Study of Interfer Bluetooth and 802.11b WIFI" oleh kumpulan penyelidik dari F Maklumat dan Sains Kuantitatif.

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ABSTRACT

WIFI (802.11b) and Bluetooth are the most common worldwide wireless standards. Both operate in the 2.4 GHz ISM band. Interference occurs while both WIFI and Bluetooth are operating concurrently in a shared environment. WIFI and Bluetooth devices suffer and loss its performance due to the interference. This is because of the collision of frequency for both devices which used the same radio frequency. WIFI is based on DSSS frequency modulation while Bluetooth is based on FHSS frequency modulation. Although these wireless standards have its own hopping technique, unfortunately interference still occurs. This performance degradation brings dissatisfaction to wireless users. Thus, a wireless network traffic analysis is conducted to determine which wireless standards suffer most from the interference. The wireless network traffic analysis consists of three phases. First phase measures the baseline performance, second phase measures the performance with interferer devices which are placed nearby and the third phase measures the wireless performance with interferer devices which are placed away. The performance of the wireless is measured and analyzed from the aspect of wireless throughput, bandwidth and response time. The outcome of the analysis and findings are used to determine the relation and the best wireless standard for a specific environment. It also discusses ways on how to reduce interference and implement wireless network with minimal effect of interference.

RESEARCH INTRODUCTION

1.0 Introduction

There are many wireless standards that operate in the 2.4 GHz ISM band. WIFI and Bluetooth are the two common wireless technologies used nowadays. These wireless technologies provide mobility to users. Wireless users are free to move around while their devices are not attached to the wired networks. The Bluetooth technology is normally used by small devices for transferring small amount of data while WIFI is commonly used on portable computers such as laptop for transferring large amount of data. Because the purposes of these devices differ, both wireless technologies are used in the same shared environment in order to gain their advantages.

1.1 Background

The ability to transmit and receive data without having a wired connection frees users to locate computing equipment in the range of coverage. Rather than rewire twisted pair or coaxial cables, time can be saved and also avoids on drilling holes in wall and possibly reduces cost. By using wireless network, it provides the ability to communicate from locations that were previously difficult or impossible to support via wired connectivity. In addition, wireless network provides a significant degree of flexibility and allows changing requirements in a timely manner. Mobility is the main advantage in wireless network environment.

In wireless network environment, the speed and bandwidth of the data transmitted over the media is less than the wired network (Fast Ethernet) and almost similar speed to Base Ethernet (10BaseT). In WIFI, it supports a maximum speed of up to 11 Mbps.