

BORANG PENGESAHAN STATUS TESIS

JUDUL: WIRELESS BANDWIDTH MONITORING

SESI PENGAJIAN: 2005/2006

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Tesis dimaksudkan sebagai Laporan Projek Sarjana Muda (PSM)

WIRELESS BANDWIDTH MONITORING

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This report is submitted in partial fulfillment of the requirements for the
Bachelor of Computer Science (Networking)

FACULTY OF INFORMATION AND COMMUNICATIONS TECHNOLOGY
KOLEJ UNIVERSITI TEKNIKAL KEBANGSAAN MALAYSIA

2005

ADMISSION

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DEDICATION

Specially dedicated to my beloved parents,
Mr Jabri Hj Arup and Mrs Saimah

For my lecturer and supervisor, Mr Faizal Abdollah at Kolej Universiti Teknikal
Kebangsaan Malaysia (KUTKM)

And lastly to my entire friend who have
encouraged, guided and inspired me throughout my journey of education

ACKNOWLEDGEMENT

I wish to take this opportunity to express my appreciation to KUTKM and all the lecturer for gave me a lot of co-operations, knowledge and work experience in my Projek Sarjana Muda II.

I never forget to thank to my supervisor Mr Mohd Faizal Bin Abdollah that give me full support to me in the project that I made with my own. And special thanks also give to Pn Robiah Bt Yosof as Co Supervisor for their patience, kindness and for always being there when I need help.

To my parents, I wish to say a lots of thank that I can't say by word to keep understand of my work as an student and the patience that they gave to me as a moral support. To all my lecturer in KUTKM for give me a guideline in taking this course. And for the end, to all my friend, I would like thanks for all the support that they give.

I wish all of you success in your future undertakings. May Allah bless all of you.

ABSTRACT

Projek Sarjana Muda is a required subject of the final year of student in Kolej Univeristi Teknikal Kebangsaan Malaysia. (KUTKM).As one of the student in Faculty Information and Communication Technology (majoring in computer network) do a Project Sarjana Muda II (PSM II) is a compulsory subject for the final year Kolej Universiti Teknikal Kebangsaan Malaysia (KUTKM) student to develop an individual project that related to the industry problem.

For the PSM II we develop a project for our final year project. This PSM II has a seven chapter to finish in the time that has been set for me to follow that time. All chapter we should finish n this PSM II is Introduction (chapter 1), Literature Review and Project Methodology (chapter 2), Analysis (chapter 3), Design (chapter 4), Implementation (chapter 5), Testing (chapter 6) and Project Conclusion (chapter 7). My project “Wireless Bandwidth Monitoring” is about monitoring system. This system will monitor access point to make network admin job easier. All connection will write down and save at Log File. This system will detect connection problem and alert network admin if occur connection problem. This system also can display current connection each access point with display a Log file. This system wills easier to monitoring access point.

ABSTRAK

Saya adalah salah seorang pelajar Fakulti Teknologi Maklumat dan Komunikasi (FTMK) melaksanakan Projek Sarjana Muda II (PSM II) adalah subjek wajib untuk pelajar tahun akhir untuk membangunkan projek individu. Untuk PSM II saya telah membangunkan satu system untuk projek akhir tahun. PSM II ini mempunyai 7 bab. Bab 1 adalah “pengenalan”, bab 2 adalah Kajian Literatur dan Projek metodologi, bab 3 adalah bab analisi, bab 4 adalah “Design”, bab 5 adalah “Implementation”, bab 6 adalah “Testing” dan bab 7 adalah “Project Conclusion”. Projek “Wireless Bandwidth Monitoring” ini adalah sistem pengawasan. Sistem ini akan monitor “access point” untuk memudahkan kerja network admin. Semua hubungan akan disimpan ke dalam fail Log. Sistem ini akan mengesan masalah hubungan dan akan memaklumkan kepada network admin jika berlaku masalah hubungan. Sistem ini juga boleh memaparkan hubungan semasa untuk setiap “access point” dengan memaparkan fail Log. Sistem ini akan memudahkan kerja untuk mengawasi “access point”

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LIST OF ABBREVIATIONS

PSM	-	Project Sarjana Muda
WBM	-	Wireless Bandwidth Monitoring
LAN	-	Local Area Network
PC	-	Personal Computer
AP	-	Access Point
SDLC	-	System Development Life cycle
IT	-	Information Technology
WLAN	-	Wireless Local Area Network
RAM	-	Random Access Memory
PC	-	Personal computer
URL	-	Uniform Resource Locators
HTTP	-	Hyper Text Transfer Protocol
MHz	-	Megahertz
MB	-	Megabytes
NIC	-	Network Interface Card
ADSL	-	Asymmetric Digital Subscriber Line
DSL	-	Digital Subscriber Line
WNIC	-	Wireless Network Interface Card

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CHAPTER I

INTRODUCTION

1.1 PROJECT BACKGROUND

Wireless is a term used to describe telecommunications in which infrared, radio, or other electromagnetic waves, rather than some form of wire, carry the signal over part or the entire communication path. It is also a type of networking technology using such electromagnetic waves to transmit data.

Bandwidth is a measure of the amount of data passing through a network at a given time. A measure of spectrum (frequency) use or capacity. For instance, a voice transmission by telephone requires a bandwidth of about 3000 cycles per second (3 KHz). A TV channel occupies a bandwidth of 6 million cycles per second (6 MHz) in terrestrial systems. In satellite based systems a larger bandwidth of 17.5 to 72 MHz is used to spread or "dither" the television signal in order to prevent interference.

One system or tool is needed to monitor wireless bandwidth. Wireless bandwidth monitoring solution helps to visualize the health of wireless network, alerts when problems arise, and tracks your actual bandwidth usage for verification and planning.

Good wireless bandwidth monitoring software lets you visualize the health of your wireless network at a glance. Automatic alerts notify you when bandwidth reaches levels you determine are unhealthy, whether there's too much traffic or not enough.

This system works out in wireless LAN (Local Area Network) environment. It used to check bandwidth in LAN (Local Area Network) which used wireless connection. We need one system or tool to monitor wireless bandwidth. This system is developed by Microsoft Visual Basic as new software. This software installed in one server that will monitor access point connection. This system will detect which AP is not functioned well. It means no activities occurred in that AP. It is also detect if bandwidth is too low or too high. Alert will appear as message box and a system will send an email to network admin who is monitoring that AP.

1.2 PROBLEM STATEMENT

Nowadays, wireless technology becomes more popular in networking environment. This is because it more simple or easier compare to wired connection. Wireless connection needs access point to connect device from server LAN (Local Area Network). Access point is a hardware device or a computer's software that acts as a communication hub for users of a wireless device to connect to a wired LAN. Access Point is important for providing heightened wireless security and for extending the physical range of service a wireless user has access to.

In the other hand, wireless technology has it's own weaknesses. One of those weaknesses is there is no connection or connection down. We can check from that AP in order own to know that access point has connection or not. By seeing at LED which if it blinking it's meant that has no problem with that access point connection. This method much easier if we want to monitor access point. But the situation will change if it involves a large amount of access point. It is impossible to check every access point by

checking to each location. It gives more troublesome to network admin if this case involves wide area or high building.

The other weaknesses are when connection is breaking down at break time or after office hour. The major problem occurs when there is no network admin stays at the office after office hours. This will lead to some problem to those who still need to access to the internet.

The solution for that problem is to have some software that will monitor every access point in one server. This system will monitor each access point and network admin and we will know which one has problem and need to be repaired. So that, no need for network admin to check every location. Furthermore, this system will alert network admin if problem occurs after office hour by sending an e-mail. Network admin will be alert about that problem and checked the problem immediately.

1.3 OBJECTIVE

Combining the passion of wireless technology in this era, monitoring system to monitor wireless connection is very needed to avoid any problem involving wireless connection. Based on this proposed monitoring system, it can be useful to achieve several objectives which are:

- i. To monitor access point connection automatically. It can help network admin to monitor large amount of access point and it will not take much time to monitor all access point in one time.
- ii. To alert network admin of connection problem. The system will ping access point any time a network admin want to do that. If access point does not reply when the system is pinging two times, so the system will assume that access

point is down. This system will send an e-mail if the connection down after office hours, so that a network admin can solve the problem immediately.

- iii. To display current connection with different color at the interface of the system. Red side if connection is down or no connection at that access point, Green side if the connection is doing well. This can help the network admin to manage the system wisely.
- iv. To display current bandwidth with graph. The system will plot a graph according to the current bandwidth which is through that access point.
- v. To display Log File database. Current connection will be save in data as a Log File.

1.4 SCOPE

This system works out in wireless LAN (Local Area Network) environment. It used to check the connection in LAN (Local Area Network) which wireless connection. This system can be used in faculty especially to monitor wireless connection or access point status.

This wireless bandwidth monitoring use Microsoft Visual Basic 6.0 as a programming language. It is because VB provides more of the actual code for a programmer than any other non-visual programming language. The structure of the Basic programming language is very simple, particularly as to the executable code. The graphical user interface of the VB-IDE provides intuitively appealing views for the management of the program structure in the large and the various types of entities (classes, modules, procedures, forms etc.). This system will build from VB code to develop an interface to easier network admin to monitor.

This system will use windows XP Professional server as a platform. This system also can alert network admin by sending an e-mail to inform about that problem.

1.5 PROJECT SIGNIFICANCE

Other system for wireless monitoring is already developed and already sold in the market. But this system has it's own advantages from other wireless monitoring which is already developed before.

Even though there are many software for monitoring wireless connection in the market, still have organization is not used any system to monitor their wireless connection. This most bind up small organization because it difficult to manage and need someone expert to manage. But this system is easy to use and not need an expert to manage or monitor that system. Ordinary network admin can manage and handle that system.

By using this system, the network admin can monitor access point easily especially in handling a network for one high building. It is troublesome for him to check each location every day to ascertain every access point have connection. With this system the network admin only needs to monitor each access point only from server and knows if occurs some problem with connection.

This system will make network admin alert 24 hours per day. If connection down or connection problem, the system will alert network admin by sending email. That email contains time connection down and the location.

Current connection will be saved in log file. This is very useful for network admin to print out the connection status to give a report to a manager in weekly meeting if he is telling to do that.

Compare to other wireless monitoring system, this system has a simple interface to monitor wireless connection and easier for network admin to monitor access point with simple button or simple interaction from network admin. This interface is user friendly for network admin to manage and understand. Furthermore it give only a short time to master that interface.

1.6 CONCLUSION

This chapter gives explanation about the project background, problem statement, objective and scope of the project, and also the project significant. The project background explains about the whole system that is wanted to develop. The problem statement is description about the problem that is needed to develop the system. It also explains about objective and scope of the project. Where as the project significant is the description about advantages of the system. In the coming second section of this report which is the Literature Review and Project Methodology, it will be focused on the findings and the methodology of the project. The project requirement such as the software and hardware requirement will be stated and mentioned. For this section too, the reader will know about the project planning, schedules and milestones during the development of this project.

CHAPTER II

THE LITERATURE REVIEW AND PROJECT METHODOLOGY

2.1 INTRODUCTION

The literature review and the project methodology is the section that provides the information on what the project will focus on during the project development. In this literature review, the developer will conduct a research that consist of collecting, studying and analyzing the resources in different media publication medium about the “Wireless Bandwidth Monitoring System” from the books, journal, proceedings, web pages and many more.

Meanwhile, the methodology used in the project development is the Network Design Model. The model consists of three main phases which are the Pre Production, Production and Post Production and each phase will be described briefly in their own process.

2.2 FACT AND FINDING

2.2.1 Programming language

No language is simple, but Microsoft Visual Basic 6.0 considered a much simpler and easy to use object-oriented programming language when compared to the popular programming language, C++. Partially modeled after C++, VB has replaced the complexity of multiple inheritance in C++ with a simple structure called interface, and also has eliminated the use of pointers.

VB is not only a language but primarily an integrated, interactive development environment ("IDE"). The VB-IDE has been highly optimized to support rapid application development ("RAD"). It is particularly easy to develop graphical user interfaces and to connect them to handler functions provided by the application. The answer is simply that VB provides more of the actual code for a programmer than any other non-visual programming language.

If you've ever programmed in the older BASIC or other command line programming language, then you'll remember that the programmer had to write the code for the entire user interface. Today's windows, buttons, lists, and other application features such as menus were not built-in to the BASIC programming language. Programmers had to create the code for these features on their own.

As much as 80% of a programmer's time was spent writing code to create the user interface to his applications (the visual interface). To eliminate this huge drain on a programmer's time, Microsoft has provided Visual Basic with the built-in capability to create the user interface using nothing more than a mouse.

This built-in interface creation capability has had the further benefit of standardizing on the user interface to Windows applications. Today, users can move from one Windows program to another and see the same basic interface tools to work with - allowing them to concentrate solely on the unique capabilities of the application.

The bottom line is that you can create an entire application shell (the user interface) very quickly and then spend most of your time working on the features which differentiate your application from its competition.

2.2.2 Wireless Standard

As you probably know, 802.11a and 802.11b each define a different physical layer. 802.11b radios transmit at 2.4 GHz and send data up to 11 Mbps using direct sequence spread spectrum modulation; whereas, 802.11a radios transmit at 5 GHz and send data up to 54 Mbps using OFDM (Orthogonal Frequency Division Multiplexing).

Of course the superior performance of 802.11a offers excellent support for bandwidth hungry applications, but the higher operating frequency equates to relatively shorter range. I've seen demonstrations of 802.11a radios delivering 54 Mbps with distances of about 60 feet, which is far less than the 300 feet or so that you'll have with 802.11b systems. As compared to 802.11b, you'll need a much larger number of 802.11a access points to cover a facility, especially large ones.

The different radio frequency and modulation types of 802.11a and 802.11b causes them to not interoperate. For example, an end user equipped with an 802.11a radio card will not be able to connect with an 802.11b access point. The 802.11 standard offers no provisions for interoperability between the different physical layers.