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JUDUL: Simplified Router Configuring Method System

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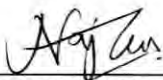
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(TANDATANGAN PENYELIA)

Alamat tetap: No 298-7, Parit Haji Baki,

En. Nazrulazhar Bahaman

Jln Abd Rahman, 84 000 Muar, Johor

Nama Penyelia

Tarikh: 24 / 11 / 2005

Tarikh: 29 / 11 / 2005

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Tesis dimaksudkan sebagai Laporan Projek Sarjana Muda (PSM)

SIMPLIFIED ROUTER CONFIGURING METHOD SYSTEM

MOHD NAJWAN BIN MD KHAMBARI

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

**FACULTY OF INFORMATION AND COMMUNICATIONS
TECHNOLOGY KOLEJ UNIVERSITI TEKNIKAL KEBANGSAAN
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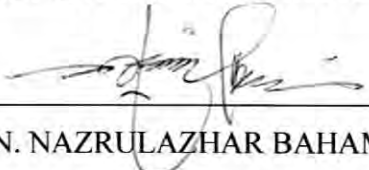
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I hereby declare that this project report entitled
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(EN. NAZRULAZHAR BAHAMAN)

DEDICATION

Specially dedicated to
My beloved family members who have
encouraged, guided and inspired me throughout my journey of education
my friends, and my colleagues.

ACKNOWLEDGEMENT

In the name of Allah the Almighty and most Merciful

Firstly, I would like to express my gratitude to En. Nazrulazhar bin Bahaman, my faculty supervisor for facilitating me in the process of undergoing my Projek Sarjana Muda 1 (PSM 1) and Projek Sarjana Muda II (PSM II). I would also like to thank all my lecturers for aiding me with strong academical and technical knowledge to be implemented during PSM 1 and PSM II besides giving motivation to gain self-belief and confidence in the process of developing the system.

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ABSTRACT

Simplified Router Configuring Method System (SRCMS) is intended to replace the existing HyperTerminal platform as the medium between a router and a computer for configuration purposes. Although there are many various HyperTerminal-like software that can be downloaded in the Internet, all of them still use the legacy method that is using command line. The main difference and criteria of the newly developed system is that SRCMS uses Graphical User Interface (GUI) compared to HyperTerminal that only uses command line. Using GUI gives much more advantage regardless in which industry the user is. Besides it is more user-friendly, it saves much time to configure a router. No more long commands and steps to be memorized. Academically, SRCMS provides a new and simplified medium for students to learn to configure a router. The router to be configured will be up in just a couple of mouse clicks away.

ABSTRAK

Sistem Konfigurasi Router Termudah dibangun dengan tujuan untuk menggantikan system yang telah lama sedia ada iaitu HyperTerminal, sebagai medium komunikasi antara computer dengan *router* atas tujuan pengkonfigurasian. Walaupun telah terdapat banyak system yang telah dicipta untuk menggantikan HyperTerminal sebelum ini boleh dimuatturun dari Internet, kesemua system tersebut masih mengekalkan ciri-ciri pengkonfigurasian yang lama, iaitu dengan menggunakan syntax. Ciri utama system yang dibangunkan ini adalah ia adalah pengkonfigurasian yang menggunakan antaramuka bergrafik, berbanding dengan HyperTerminal yang hanya menggunakan syntax sahaja. Penggunaan system untuk mengkonfigurasi *router* dengan menggunakan antaramuka bergrafik memberikan banyak kelebihan, tanpa mengambil kira suasana industri di mana seseorang pengguna itu menggunakan system ini. Dengan kata lain, sistem bergrafik ini sesuai digunakan di mana-mana industri sekalipun. Di samping antaramuka bergrafik yang memudahkan pengguna untuk mengkonfigurasi, ia menjimatkan lebih masa untuk mengkonfigurasi sesebuah *router* itu. Pengguna tidak perlu lagi untuk menghafal arahan syntax sepertimana digunakan dalam HyperTerminal. Dari segi akademik, sistem ini menyediakan satu medium yang lebih mudah dalam suasana pembelajaran dan pengajaran untuk pelajar-pelajar belajar untuk mengkonfigurasi *router*. Hanya beberapa klik pada tetikus, sesebuah *router* itu telah siap dikonfigurasi.

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LIST OF ABBREVIATIONS

ASCII	-	American Standard Code for Information Interchange
AUT	-	Application Under Test
HT	-	HyperTerminal
IP	-	Internet Protocol
IT	-	Information Technology
KUTKM	-	Kolej Universiti Teknikal Kebangsaan Malaysia
LAN	-	Local Area Network
MAN	-	Metropolitan Area Network
NIC	-	Network Interface Card
GB	-	Giga Byte
GHz	-	Giga Hertz
GUI	-	Graphical User Interface
PC	-	Personal Computer
PSM I	-	Projek Sarjana Muda I
PSM II	-	Projek Sarjana Muda II
RAM	-	Random Access Memory
SDLC	-	Software Developmnt Life Cycle
SRCMS	-	Simplified Router Configuring Method System
STP	-	Software Test Plan
UAT	-	User Acceptance Test
UTP	-	Unshielded Twisted Pair
WAN	-	Wide Area Network
WWW	-	World Wide Web

APPENDICES

APPENDIX NO.	TITLE
A	Cisco 2600 Series Router Overview
B	Internet History
C	Questionnaire for Data Mining
D	ASCII Table
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CHAPTER I

INTRODUCTION

1.1 Project Background

With computer networking expands each day from a simple Local Area Network (LAN) 20 to 30 years back to Wide Area Network (WAN), Metropolitan Area Network (MAN) and wireless GSM communication, network management becomes more important than ever. Network administrators and network managers have to manage the network wisely in order to make sure that the network is in the optimum form thus much devices have to be used not only switches that connect workstations but also routers that connect networks.

Nowadays, routers are used in every industry that involves computer networking compared to 10 to 20 years back where routers are hardly to find. It does not only limit to computer networking or computer related industries but it actually involved in all industries that have computer networks. In other words, all industries that use computers that are connected together as one of their communication tool usually use routers especially in big industries. It can clearly be seen nowadays as all of the industries especially in Malaysia have their own department that control, manage and monitor networks regardless they are computer related industries or not. For an example, although the main purpose of hospitals is to care and cure sick people, they have their own department (e.g.: Data Management Department, IT and

Network Department) that takes care of the computer network for communication of intra and inter departments besides retrieving data from database servers and the Internet.

In this project, a new system that may replace HyperTerminal will be developed in order to meet the rapid growing rate of computer networks in Malaysia; Simplified Router Configuring Method System (SRCMS). It will not only be more efficient but also more user friendly and not much time consuming as compared to HyperTerminal.

1.2 Problem Statement

With routers become widely used abreast with expands of networks, it is more important for managers and administrators to configure routers efficiently. Bigger networks mean more information flows within the networks. In bigger industries with larger networks especially in communication companies (e.g.: Maxis, Celcom, Digi), it is very, very crucial to configure network wisely with a limited time. This is because, the downtime of networks involves customer service affecting which means not only the company itself will lose its profit, but also the customers that use the company's services.

However, although routers are becoming widely used, the method of configuring it does not change much. Basically, to configure a router the user needs to enter commands during HyperTerminal session where the user needs to type it line by line. This is time consuming especially it involves long commands that are rarely used where the user needs to memorize it. Problem arises when in the worst case; the user forgets the commands during downtime which involves much of company's profit with a limited of time.

SRCMS simplifies the process to configure routers by developing another platform as another communicator between a router and a computer.

1.3 Objective

Before this, router configuration process involves commands that need to be typed and memorized by users where it does not only consume much time but also bounded to users that really learn about router configuration.

However, upon completing this new system, it is expected that it achieves the following objectives:

- a. To simplify the process for router configuring where the users only need to click the buttons on the interface only.
- b. To save time during configuring by using a GUI for interaction between users and the router instead of command line. The users do not have to memorize each command line.
- c. To offer a new simplified and faster medium for students to learn about router configuring.
- d. To aid the existing syntax command into a friendlier interface

1.4 Scope

Basically, the project will give users a new approach in router configuring. Users will no longer need to memorize command lines but only have to know the IP addresses involved in the network where they wanted to configure.

Specifically, the system that is going to be built is based on the Cisco 2600 series routers. The settings are all set to the default speed the router supports, which are the baud rate (9600), parity bit (Null), data bit (8) and stop bit (1). All the researches, testing and project implementation are focused on the Cisco 2600 Series router. Basically, there are several commands that is going to be implemented under this scope. The basic commands are entering the privilege mode, entering IP addresses, setting passwords and several more basic commands. Besides that, the main feature for this system is to shift between the GUI mode and the syntax based mode. This will give the user a much more freedom to choose the environment he prefers, besides supporting both the rookie and expert router users.

Basically, this project is a system that actually connects a computer to a router. It is much more similar to HyperTerminal but it is in a graphical user interface (GUI) form. Buttons are provided in the interface and all of the processes to configure the router are via the button.

1.5 Project Significance

This project will benefit all of the industries in Malaysia. As for network managers and network administrators where they configure routers and networks everyday, SRCMS will make their life much easier. No more long command lines to be typed but only buttons that will give the users total control of the router.

The importance of the system that use button is that it does not consume much time. With that, if networks breakdown, the total downtime of the computer network will be much shorter as the process to recover back the network does not consume much time compared using HyperTerminal.

Upon completing this project, users will have a much more user friendly way. The default setting will be dropdown buttons. These include the basic network commands such as ping, tracet and others. However, command lines also exist as the background process in order to keep track of what had being done by users. It can also be viewed back as a log file (*.txt) or being printed. Users can choose whether to use buttons or command lines.

1.6 Conclusion

Upon completing the project, it is expected that the system will be widely used as the main tool for communicating a computer to a router to be configured. With its friendly GUI, it will surely offer the users a more convenient and efficient way, totally different from the HyperTerminal predecessor thus meets the main objectives as stated above.

Overall, the system has not been developed for lower level routers where these types of routers are actually currently being used in majority of the industries. Upon the development of this system, it does not only save time to configure a router, but also can be used for users that do not have specific information technology background regarding router configuration.

CHAPTER II

LITERATURE REVIEW AND PROJECT METHODOLOGY

2.1 Introduction

In nowadays fast pace daily life, communication became an integral part of life in ensuring the growth of industries globally. It can be seen not only in Malaysia but on all part of the countries in the world. 30 to 40 years ago, the main means of communication maybe fixed phone line but since it is expensive and can only carry voice (with some latency of a couple of seconds), an alternative method of communication must be developed. Computer networking became more famous in the later stage of 1980s and it continued to develop as the main means of data transferring method until it brought to the first internetwork of the world in 1992, the Internet.

Starting in 1995, the world had been rocked by the third wave of human civilization; globalization. Starting in 1995, there are a total of 16 million user online and by the year 2001, it is reported that there are a total of 513.41 million users online all over the world.

Table 2.1: Total Number of Users Online by Year

DATE	NUMBER	% POP	SOURCE
August 2001	513.41 million	8.46	Nua Ltd
August 2000	368.54 million	6.07	Nua Ltd
August 1999	195.19 million	4.64	Nua Ltd
Sept 1998	147 million	3.6	Nua Ltd
November 1997	76 million	1.81	Reuters
December 1996	36 million	.88	IDC
December 1995	16 million	.39	IDC

Gromov, Gregory R. History of Internet and WWW: The Roads and Crossroads of Internet History.

<http://navigators.com/stats.html>

In Malaysia, Internet started to be popular in 1995 where Microsoft launches its user friendly operating system, Microsoft Windows 95 although its predecessor, Windows 3.1 can also be connected to the Internet. Jaring was the first company to offer Internet to home users. At that time, home users get connected to the Internet only via dial-up modem using fixed phone line. However, although Jaring was the first company to offer Internet, and since Telekom Malaysia is the one and only company to offer fixed phone line, Telekom Malaysia also started to offer Internet services and started to takeover the domination of Internet services from Jaring until now. Starting in 2003, Telekom Malaysia started to offer a faster, reliable, and very affordable Internet service to home users known as Streamyx with many packages. For example, a user has to pay only RM88 for a downlink of 1mbps and 512 kbps of uplink with free modem given and a waived installation payment to get connected to the Internet 24 X 7.

As networks became larger and faster, more devices are needed to manage and monitor the flow of the data packets. Computer networks now are used not only to retrieve information from a server, but also to transmit and receive very, very important information. For example, nowadays with e-economy, all bank account transaction and credit card numbers are transmitted across the Internet every second.

This is what we call high priority data transmission. From that, it is learnt that latency of data retrieval/ transmission, network downtime, low security and much time to recover from downtime will all contribute to a loss of thousands or maybe millions of dollars to an industry.

In order to control, manage and monitor the network not to become much havoc, many devices had been used. Router is one of them. Compare to bridges and repeaters, routers are more sophisticated. They have access to network layers and contain software that enabled them to determine which of several possible paths between those address the best for a particular transmission is. Routers operate in layer 1 to 3 of the OSI model. The best path means the shortest, cheapest, fastest and more reliable.

2.2 Fact and Findings

Below are some of the findings in the process to build the Simplified Router Configuring Method System.

2.2.1 Existing HyperTerminal Software

Besides the HyperTerminal that comes with the Microsoft Windows operating system, there are various other HyperTerminal-like software on the Internet; regardless they are shareware, freeware or just for trial and beta testing.