TESIS^ APPROVAL STATUS FORM

JUDUL: ANALYZING OF FTMK NETWORK PERFORMANCE

SESI PENGAJIAN: 04/05

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^ Tesis dimaksudkan sebagai Laporan Projek Sarjana Muda (PSM)

ANALYZING OF FTMK NETWORK PERFORMANCE

TAN BEE HOOI

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

FACULTY OF INFORMATION AND COMMUNICATION TECHNOLOGY
KOLEJ UNIVERSITI TEKNIKAL KEBANGSAAN MALAYSIA
2005

ADMISSION

I admitted that this project title name of

ANALYZING OF FTMK NETWOK PERFORMANCE

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STUDENT : _____ Date : 22.11.2005

(TAN BEE HOOI)

SUPERVISOR: _____ Date : 22.11.2005

(ENCIK OTHMAN BIN MOHD)

DEDICATION

To my beloved parents, siblings and fellow friends…

ACKNOWLEDGEMENTS

I would like to take this opportunity to personally express my deepest appreciation and gratitude. The completion of this project would be impossible without the help of these people. It gives me a great pleasure in completing this project.

First and foremost, I would like to thank my Project Supervisor, Encik Othman Bin Mohd for her concerns, time, advice, guidance and supervision throughout the progress of the project. Her invaluable information and suggestion is much appreciated.

Second, I would like to thank my Project Panel, PM Dr Sharin Sahib & Sahibudin for her time and guidance throughout the progress and completion of this project.

Last but not least, thanks to my family for their love, support and trust.

ABSTRACT

Project Sarjana Muda (BITU 3973) is carried out to do case study on network performance in FTMK faculty of KUTKM. The purposes of this project are to identify the problem of current network connection in KUTKM and to propose a solution to improve the network performance in KUTKM.

The project will help to overcome the slow network problem which is faced by FTMK faculty in KUTKM. Besides that, this project also helps to monitor the current network design and control the usage of network. The importance of this case study is to allow further understanding on the connection of the network and the method to implement network analysis and design.

In conclusion, this project will help to enhance and overcome the existing network problem in FTMK faculty of KUTKM.

ABSTRAK

Projek Sarjana Muda (BITU) yang dijalankan adalah untuk membuat kajian kes berhubung dengan keupayaan sistem rangkaian bagi FTMK di dalam rangkaian KUTKM. Tujuan kajian ini adalah untuk mengenal pasti masalah berkiatan persambungan dengan pemasangan rangkaian, "routing" dan "bottleneck" yang dihadapi sekarang. Seterusnya, mencadangkan penyelesaian dalam memperbaiki masalah berhubungan dengan rangkaian di FTMK khasnya di KUTKM.

Projek ini akan membantu untuk mengatasi masalah perlahan semasa melayari internet di fakulti FTMK. Selain itu, projek ini juga membantu dalam mengawasi dan memantau muatan trafik pada rangkaian KUTKM. Kepentingan kes membaca ini membolehkan kefahaman lanjutan ke atas persambungan dan pemasangan sistem rangkaian di KUTKM dan cara melaksanakan penganalisisan dan reka bentuk rangkaian.

Kesimpulannya, projek ini diharap akan dapat membantu dalam meningkatkan lagi pengetahuan saya di dalam bidang yang saya ikuti. Di samping itu adalah diharapkan cadangan kajian oleh pihak tertentu dalam membaiki masalah yang dihadapi pada masa ini.

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KUTKM	-	Kolej Universiti Teknikal Kebangsaan Malaysia
FTMK	-	Faculty Teknologi Maklumat Dan Komunikasi
VLAN	-	Virtual Local Area Network
LAN	-	Local Area Network
OSI	-	Open Systems Interconnection
MIB	-	Management Information Base
STP	-	Spanning Tree Protocol
SNMP	-	Simple Network Management Protocol
ICT	-	Information And Communication Technology
DNS	-	Domain Name System
DHCP	-	Dynamic Host Configuration Protocol
PC	-	Personal Computer
DMZ	-	Demilitarized Zone
HDLC	-	High-level data link control
ISL	-	Inter-Switch Link Protocol
PSM	-	Projek Sarjana Muda
CPU	-	Central Processing Unit
TCP/IP	-	Transmission Control Protocol/Internet Protocol
UTP	-	Unshielded Twisted Pair
IEEE	-	Institute of Electrical and Electronic Engineers
SPP	-	Serial Port Profile
POF	-	Plastic Optical Fiber
NIC	-	Network Interface Card

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CHAPTER I

INTRODUCTION

1.1 Project Background

Kolej Universiti Teknikal Kebangsaan Malaysia (KUTKM) was established on December 1, 2000. It was established under Section 20 of the University and University College Act 1971 (Act 30) under the Orders of Kolej Universiti Teknikal Kebangsaan Malaysia (Incorporated) 2001. KUTKM is a PUBLIC UNIVERSITY (IPTA). It is a pioneer in the use of the "Practice and Application Oriented "teaching and learning method for technical education in Malaysia.

KUTKM has five faculties namely Electrical Engineering, Electronic and Computer Engineering, Mechanical Engineering, Manufacturing Engineering, and Information and Communication Technologies. The academic programs offered by the university are conducted in a way where equal emphases are given to theoretical and practical aspects of the discipline. The teaching and learning approaches at the university are practice and applications oriented and involve:

- Competency development
- Action-based learning
- Simulation of real situations and problems
- Solving industry related problems

This project is to study on network performance at faculty FTMK using Network Performance Monitor. Network Performance Monitor is a real-time network monitor that can track network latency, bandwidth usage, packet loss, traffic and other network statistics.

Currently, when students surf the internet at FTMK, they are facing network slow problem. Because of that, this project is to study on the performance of network at faculty FTMK and to identify the problem. This project is also to identify traffic bottlenecks at faculty FTMK. Since a server has to support multiple clients, it often has bottleneck problem, it will slow down the speed of the network in KUTKM.

1.2 Problem Statement (s)

The university are consists of 5 faculties and 12 departments. The concept of study offered by the university is conducted in a way where equal emphases are given to theoretical and practical. So, the connection to the network is very important to the members of the university.

Base on current network facilities that are already installed in KUTKM since 2001, there are a lot of problems that they are facing. The problems are:

- Network is slow when surfing to the internet at FTMK.
- Unable to connect to the network due to connection problem.

1.3 Objectives

Essentially, the new network is designed to achieve the following objectives:

- To identify current network problem faced by the faculty when they are using KUTKM network.
- To study and improve the performance of the existing design based on the current device that they are using.
- To analyze the network problem.
- To propose new network design for faculty of ICT and to improve reliability.
- To propose possible improvement.

1.4 Scopes

When users online at FTMK faculty, they will face the problem of slow network. For this project, the current design of the network in the faculty needs to be analyzed to find out the problems before proposing a solution to improve it. The type of cables, VLAN, type of backbone, topology, spanning tree protocol, problem of the broadcast and the type of device to be used will need to be considered.

The scopes of this project will cover items below:-

i. To identify the problems faced when users online at FTMK.
ii. To analyze the current logical and physical design of network in FTMK faculty.
iii. To study the network performance in FTMK faculty.
iv. To propose a new network design based on current design.

1.5 Project Significance

For this project, the current network design for KUTKM I will be analyzed to identify current network problem and propose a possible improvement to the network connection in KUTKM. After the improvement, users in KUTKM can enjoy a higher speed internet service. The users will seldom face server or network down problems.

1.6 Conclusion

The main purpose of this project is to identify the network problem of KUTKM, to understand the design based on the current network design and to propose the possible improvement for KUTKM connection network. Base on that, a new network design will be proposed to improve the problem they are facing. Hope that this project can help the network administrator of KUTKM in solving the problem that they are facing.

CHAPTER II

LITERATURE REVIEW AND PROJECT METHODOLOGY

2.1 Introduction

In order to redesign the network design of Faculty of Information Communication And Technology, a research has been conducted in order to help to understand. The research was mainly conducted through the Internet and reference from network design and protocols books was also done.

To begin with, network analysis and design have traditionally been considered art, combining an individual's particular rules on evaluating and choosing network technologies, knowledge about the technologies, services and protocols can be meaningfully combined, experience in what works and what doesn't, along with selections of network architectures.

I begin my project by applying a system methodology to networking. This methodology is relatively new and in the final section, the network architecture is used as input for the network design process, where technology selection and connectivity are determined.

2.2 Fact and Finding

2.2.1 Concept and Theory

The network analysis and design consists of many concepts and theories. The network analysis and design covers everything like local area network, backbone network, functional design process, logical design process and physical design process.

These theories are important and must be comprehend before the development of the network analysis and design can begin.

2.2.2 Network Fundamentals

The types of networks are very important. The design and operational characteristics of each type are presented, followed by a description of the architecture and standards associated with most organizational networks. Since networks vary in size and scope, we can classify networks based on design complexity.

Remote access technologies enable a station to connect to a LAN over extended distances, using telecommunications circuits. In general internetwork fundamentals is an internetwork connects LANs in the same way a LAN connects PCs. An internetwork can be used to link two or more existing LANs.

2.2.3 Open Systems Interconnection (OSI) Reference Model

In general, communication on a LAN or an internetworking takes place at many levels. The objective of the OSI model is to provide a structured approach for the development of all types of networks. The Open Systems Interconnection model is a layered framework for the design of network systems that allows for communication across all types of computer systems. It consists of seven separate but related layers, each of which defines a segment of the process of moving information across a network. The seven layers are:-

i. **Layer 7 – Application**

Provide services to the users of the OSI environment. It provides services for FTP, transaction server, network management, etc.

ii. **Layer 6 – Presentation**

Performs generally useful transformations on data to provide a standardized application interface and to provide common communications services. It provides services such as encryption, text compression and reformatting.

iii. **Layer 5 – Session**

Provide the control structure for communication between applications. It establishes, manages and terminates connections (sessions) between cooperating applications.

iv. **Layer 4 – Transport**

Provide reliable, transparent transfer of data between end points. It provides end-to-end error recovery and flow control.