



**FACULTY OF ELECTRICAL ENGINEERING  
UNIVERSITI TEKNOLOGI MARA  
SHAH ALAM, SELANGOR**

**SUBMISSION OF PROJECT REPORT (THESIS) FOR  
INDUSTRIAL PROJECT (KJE554)  
B. ENG. (HONS) ELECTRICAL ENGINEERING**

**NAME : SITI FUWAIZAH BINTI MOHD GHAZALI**  
**UITM\_ID : 2000380950**  
**SEMESTER : 11 STUDY MODE: PLK**  
**PROJECT TITLE : ANALYSIS PERFORMANCE OF QUALITY OF  
SERFICE (QoS) IP VPN (INTERNET PROTOCOL VIRTUAL PRIVATE  
NETWORK)**

This is to certify that the necessary amendment has been made to the project report (thesis) according to the recommendations.

**SUPERVISOR'S NAME : IR. MUHAMMAD IBRAHIM**

**SUPERVISOR'S SIGNATURE : .....**

**DATE : 20 NOVEMBER 2006**

## **ACKNOWLEDGMENTS**

In the name of Allah S.W.T, the Most Gracious and the Most Merciful who have given me the strength and ability to completed this final project. Prayers be upon His final Prophet Muhammad S.A.W.

My deepest and warmest appreciation and gratitude to my project supervisor, Ir. Muhammad Ibrahim for his continued guidance, encouragement and invaluable advice has helped me tremendously in completing this project. Apart from being actively involved in this project, he was also a continuous source of constant inspiration through out the completion of this project. My gratitude also goes to Puan Norashimah Baba, coordinator of final year project for her tireless enthusiasm and positive opinion to drive students towards excellence.

Special thanks are addressed to my Manager, Encik Nur Khan Akbar Khan, for his generous counsel on the research methodology and statistical analysis. The knowledge that has been given is worthy enough for my future practice. I am grateful to the Yayasan Telekom for providing the financial support necessary for the out campus programmed at Universiti Teknologi MARA for granting me the scholarship and the examination leave.

The final, and most important acknowledgement is owed to my family especially my lovely husband, Syahrul Nizam Aziz, my mother, Puan Hajjah Siti Masnah Kaslan and also my daughters, Syifaa' NurAimuni and Syifaa' Nur Asma' for their prayed, understanding, support and expectations To all my colleagues for their support especially Azman, Shima and Fadhilah . Last but not least, thanks to all the people that involved directly and indirectly towards the success of this project.

# TABLE OF CONTENTS

DECLARATION	i
ACKNOWLEDGMENTS	iv
LIST OF TABLES	v
LIST OF FIGURES	vi
LIST OF APPENDICES	viii
ABREVIATION	ix
CHAPTER 1	1
INTRODUCTION	1
1.1 Preface	1
1.2 Project Significant	2
1.3 Scope of study	2
1.4 Objective of Study	2
1.5 Organization of this report	3
CHAPTER 2	4
LITERATURE REVIEW	4
2.1 Introduction	4
2.2 Background of jitter	4
2.3 What causes of jitter.	6
2.4 Jitter in packet voice network.	7
2.5 What is QoS	9
2.6 QoS in packet switched network	11
2.7 How QoS define	12
2.8 Service performance parameters	13

# **CHAPTER 1**

## **INTRODUCTION**

### **1.1 Preface**

Next generation IP based networks are heading into the multiservice markets which provide multiple service classes over an IP network. Quality of Service (QoS) of Internet Protocol Virtual Public Network (IP VPN) is a set of requirements that the network must meet to ensure a service level for each type of traffic. A private IP based network infrastructure is a network service that is able to prioritize traffic according to the application's importance using advanced Multi Protocol Label Switching (MPLS) technology. This technology enables secure and reliable performance levels. Private-based MPLS network provides better QoS compared to public networks.

## **1.2 Project Significant**

Upon completion of the study, it is expected that packet will arrive within a certain delivery time and will not be discarding because of queue overflows, provided that the flows traffic stay within the bounds of it specified traffic parameter. It recommends that we police high priority traffic and define small queue-limit to ensure minimal delay variation (jitter).

## **1.3 Scope of study**

The study will focus on QoS that is policy-based networking. It determines how to use the network resource under specific condition and how much bandwidth to allot to certain type of application. QoS is measured using three parameters: jitter (change in time between packets), delay (latency) and packet delivery. But, this project focuses on jitter performance due to simulation test result and data collection due to customer link.

## **1.4 Objective of Study**

The objectives of study are to analyze the performance of jitter QoS in IP VPN network through Network Management System (NMS) by comparing public network through the simulation test program. To get full description how QoS is often interchangeably with Class of Services (CoS). The goal of analysis will compare the QoS is better on public network or IP VPN network.