IMPLEMENT AND ANALYZE WIRELESS NETWORK AT POLITEKNIK SULTAN ABDUL HALIM MU'ADZAM SHAH (POLIMAS)

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JUDUL: IMPLEMENT AND ANALYZE WIRELESS NETWORK AT POLITEKNIK SULTAN ABDUL HALIM MU'ADZAM SHAH (POLIMAS)

SESI PENGAJIAN: 2008/2009

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IMPLEMENT AND ANALYZE WIRELESS NETWORK AT POLITEKNIK SULTAN ABDUL HALIM MU'ADZAM SHAH (POLIMAS)

NAIMAH BINTI AMLUS

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

FACULTY OF INFORMATION AND COMMUNICATION TECHNOLOGY
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2009

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DECLARATION

I hereby declare that this project report entitled

IMPLEMENT AND ANALYZE WIRELESS NETWORK AT POLITEKNIK SULTAN ABDUL HALIM MU'ADZAM SHAH (POLIMAS)

Is written by me and my own effort and that no part has been plagiarized without citations.

STUDENT :..... Date : .....

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SUPERVISOR :.....Date : .....

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DEDICATION

Special thanks to my beloved family and person who always support me for complete this project to gather to achieve the Bachelor of Computer Science. Besides, I also would like to special thanks to my supervisor who is my supervising my projects all this semester.

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ACKNOWLEDGEMENTS

First and foremost, I would like to take this opportunity to thanks Universiti Teknikal Malaysia Melaka (UTeM) for this 'Projek Sarjana Muda' in fulfill the requirements of completing Bachelor of Computer Science of Computer Science (Computer Networking) and improve the students in all the best ways.

Special thanks to Dr Suhaimi Basrah, my supervisor for his invaluable guidance and constructive suggestions and devices throughput this project which really help me to progress throughout the project.

Thanks a lot too technician and workers at Politeknik Sultan Abdul Halim Mu'adzam Shah (POLIMAS) which is En Mohd Noor bin Shabudin and En Ashizan bin Khairul for give cooperation, permission and information to complete my project.

I would like to express my sincere to all my classmates and others for their support and help in one way or another.

Last but not least, I wish to express my deepest appreciation and heartfelt thanks to my beloved family for their understanding, motivation, support, and sacrifices so that I attend and success in this project.

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ABSTRACT

Wireless networking is the core of today's business and management that approach into mobility strategy. As the wireless networking are growing, this project was proposed to Politeknik Sultan Abdul Halim Mu'adzam Shah (POLIMAS) that situated at Kedah Darul Aman as a case study to improve the network reliability that transitioning from wired network to the wireless network. The implementation of wireless network at POLIMAS are based on simulation technique where all the wireless designs will mapped into Opnet Modeler 9.1 that will capture the real picture of networking infrastructure at POLIMAS. All the network designs will be simulating based on the configuration that have been analyzed from researching, interviewing technique and distributing of questionnaire. Perhaps, this project will give the big contribution to POLIMAS where this project will be the guidelines and reference to network administrator and technician in implementing wireless network for future network environment.

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ABSTRAK

Rangkaian komunikasi tanpa wayar adalah teras kepada perusahaan dan pegurusan dalam memperkenalkan strategi mudah alih. Dengan perkembangan penggunaan rangkaian tanpa wayar yang meluas, projek ini tela memilih Politeknik Sultan Abdul HALIM Mua'dzam Shah (POLIMAS) yang terletak di Kedah Darul Aman sebagai kajian kes bagi menigkatkan lagi infrastruktur rangkain daripada komunikasi wayar kepada komunikasi tanpa wayar . Pelaksanaan rangkaian komunikasi tanpa wayar di POLIMAS akan menggunakan teknik simulasi di mana infrastruktur rangkaian akan di lukis di dalamOpnet Modeler 9.1 yang akan memberikan gambaran sebenar infrastruktur rangkaian di POLIMAS. Rekabentuk rangkaian akan disimulasi berdasarkan konfigurasi yang telah dianalisis daripada kajian, temubual dan 'questionaire'. Diharapkan projek ini akan memberikan sumbangan yang besar kepada POLIMAS di mana projek ini akan menjadi panduan dan rujukan kepada pentadbir rangkaian dan juruteknik di POLIMAS dalam memperkenalkan rangkaian komunikasi tanpa wayar pada masa hadapan di agensi tersebut.

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CHAPTER I

INTRODUCTION

1.1 Project Background

The project will be work on for Projek Sarjana Muda (PSM) is to implement wireless network at Politeknik Sultan Abdul Halim Mu'adzam Shah (POLIMAS). The project consists of be a network design of the new network (wireless) and merge with the existing network design. The implementation and testing will just cover a few of locations and departments with current wired network and have many of users. These include simulation for certain data or performance. The type this company place providing higher education. So, the target user of this project is student of POLIMAS and also their staff.

The current network that exists in POLIMAS as all wired. This mean the client connect to each other by unshielded twisted pair cable or fiber optic cable. This project will benefit the student as their just need to have laptop to access to the network or internet within campus area, so student easy to do their assignments and discuss with friends. The staff in office can move to meetings or budge around the places with their laptops while still connecting to network. Besides that, the wired network needs to trail wires all over the place to ensure users will be connected to the network.

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As an alternative, this project will propose the implementation of wireless technology at POLIMAS based on simulation technique. This implementation of wireless features allow the users in POLIMAS to budge around, internal, and external without having to reconnect the network and also have to log on and off the wired at each location.

Furthermore, this project will enhance the knowledge in wireless technology and learn how to face real situation of implementing wireless features.

1.2 Problem Statement

POLIMAS is government education that is located in Kedah Darul Aman. This institution consist a few of building. The existing wired network at POLIMAS does not support mobility features where users cannot connect to network anywhere they want. Wired network offers an environment where users especially users are tied to their desks. The users especially staff and student cannot budge around to access the network. Besides that messy cables can be found all over the place. Wire can limit the place of accessing network facilities because unreachable nodes to access network.

This problem is due to the wireless technology that has not yet being implemented in this institution. Wireless networks eliminate messy cables and offer more convenient device and computers for staff and employees. The target of this new wireless network connectivity is to ensure network environment at POLIMAS support mobility features and at the same time it also will ensure the quality of services and the overall services uptime, low the risk of downtime and increase management productivity.

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1.3 Objective

i. **Make analysis of the existing network design**

- To analyze existing network performance using simulation technique.

ii. **To design the wireless network at POLIMAS**

- Only a few of locations with current wired network and have many of users will be focused.

iii. **To analyze network performance of the implementation wireless at POLIMAS by using simulation technique.**

iv. **To proposed network design with implementation of wireless features**

- Design two or more design of implementation of wireless to compare their network performance.
- The best performance of network design will proposed to POLIMAS for their references for future wireless technology development.

1.4 Scope

The current network facilities only allow users especially student and staff to access to access to network when they have their own personal computer and get connected with wired network. So the scope of this project is to expand the network facilities through the implementation of wireless system. The design scope for wireless LAN network covers all areas in departments and rooms. The target users for this Wireless LAN design are student and staff around 150-200 users that will use the network.

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1.5 Project Significance

This project is important because: -

i. The implementation of the wireless system will reduce the messy cables like in wired network.
ii. Users especially staff and student can access to network wirelessly.
iii. Increase reliability because there will be no down time from cable faults. It also reduces the downtime of network and the cost associated with replacing cable.
iv. The implementation of wireless also will include in analyzing the network performance of the implementation of wireless at POLIMAS by using simulation technique.

1.6 Expected Output

i. Reduce the cabling that cause messy cable all over the place.
ii. Allow users staff and student can budge around and anywhere to access network at location which provide wireless connection
iii. Analyze the performance of the implementation of this wireless connection at POLIMAS.
iv. Propose the best network design based on simulation technique.

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1.7 Conclusion

As a conclusion, to implement the wireless LAN project, there are some things to consider before we can precede it. Firstly, we must know the problem statements that occur with the organization. After that, don't forget to know how objectives or goals can be achieved from the project. Next, we must include the scope of the project where it is important to determine the target user and to make sure that the project is not out of scope.

The purpose of this project is to do an analysis of the existing network design, to make a simulation to check any problem probability that can occur and the creating of new network design also the implementation of the wireless network. As the POLIMAS want to provide wireless network to their student and staff, the case study will benefit the POLIMAS and many people.

In the next chapter, all the literature review and project methodology will be discuss to justify the best choice and to discover how a project is related to the work of others. Furthermore, the next chapter will discuss how to describe the activities in the project development.

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CHAPTER II

LITERATURE REVIEW AND PROJECT METHODOLOGY

2.1 Introduction

This chapter will describes the overall definition of the literature review, background of the topic, summary detailed of previous research and the evolution or justification based on the project topic. It includes methodology used, hardware and software requirements, project schedule and milestones and lastly the conclusion for this chapter.

A literature review is a select list of available resources and materials with a strong relation to the topic in question, accompanied by a description and a critical evaluation and comparative analysis of each work. The good research and writing basically guided by a review of the relevant literature. A literature review is the mechanism by which research is viewed as a cumulative process based on integral component of the scientific process. The component of literature review is the actual literature search and the writing of the review.

Methodology is define as a series of related methods or techniques that the study of methods. The methodology is a way to use all available approaches, technique, and tools used to achieve predetermined objectives. The qualitative method and quantitative method will include forecasting, statistical and modeling, and combined method such

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that can be approached. The applicable methodology project can help, manage, and maintain system development at the same time.

2.2 Literature Review

2.2.1 Domain

In this project, the domain for the project is networking design concept and simulation. To be specific these projects focus on wireless simulation. That mean, this project will have output of simulation on how to implement the wireless networking.

2.2.2 Keyword

i. **Wireless LAN**: A LAN implemented without using conducted media. To connect the workstation together, it uses broadcast radio, spread spectrum radio, microwave radio or infrared light transmission.

ii. **VLAN**: It is a short form of virtual LAN. LAN is form a group of node by using MAC or IP address by packet tags or by port address on the switch, rather than by the typical physical connection to a common medium.

iii. **Opnet Simulator** : it is a software that enables the possibility to simulate the networks with various protocols.

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