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JUDUL: NETWORK ANALYSIS AND DESIGN OF HEADQUATERS OF TRACTORS MALAYSIA SDN BHD

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NETWORK ANALYSIS AND DESIGN OF HEADQUATERS OF TRACTORS MALAYSIA SDN BHD

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DECLARATION

I hereby declare that this project report entitled

NETWORK ANALYSIS AND DESIGN OF HEADQUATERS OF TRACTORS MALAYSIA SDN BHD

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

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DEDICATION

On the whole my dedication goes to my father who I admire most and who taught me to survive in this challenging world. To my mother who never has been lack of love and care and to all my friends for their support and courage and to the Manager of IT Department of Tractors Malaysia Sdn Bhd En. Nor Azmi Baharudin for allowing me to take the network of Tractors Malaysia Sdn Bhd as the case study of my project and my deepest thanks to En Francis Wong as the IT Admin in Tractors Malaysia Sdn Bhd for giving me the sufficient information that I needed to do this project

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ABSTRACT

This project is actually a case study of the existing network of Tractors Malaysia Sdn Bhd Headquarters. This projects case study is basically studying and analyzing the existing network of the headquarters of Tractors Malaysia with limited scope and particular objective. Tractors Malaysia Sdn Bhd has a branch in each state in Malaysia but the headquarters in situated in Puchong , Selangor. The network of headquarters of Tractors Malaysia consist of 270 users at present but this network was implemented at 1998 with initially only 50 users but in the span of 9 years the network growth of the network users is up to 270 at present. This is a totally enterprise network therefore its main purpose is for the business of Tractors Malaysia. This project objective is to study and analyze the existing network then from the findings the problem of the network is been identified. A number of steps were done in the process of analyzing to get detailed information about the network; the steps that were done are interview session, observation and obtaining raw data from monitoring tool. Once the problem has been identified, the number problems will be narrowed down to a specific problem that needs to be focused in the project. The output of the project is to find solution for the specific problem and then to design a new network. The approaches that are used to find the solution for the problem is done base on the findings from literature review. Meantime both logical design and physical design that is proposed need to be simulated in order make sure the new design meets the requirement and objective of the project. OPNET Modular has been used as the simulation tool in this project to simulate the new network design before implementing for real.

ABSTARK

Projek ini merupakan kes kajian rangkaian komputer ibu pejabat organisasi Tractors Malaysia Sdn Bhd. Kes kajian projek ini hanya meliputi hanya rankaian computer ibu pejabat Tractors Malaysia Sdn Bhd yang sedia ada dengan mengfocus pada skop yang khusus serta objektifnya. Organisasi Tractors Malaysia mempunyai cawangan di setiap negeri dan lokasi ibu pejabatnya ialah di Puchong , Selangor. Rankaian computer ibu pejabat Tractors Malaysia merangkumi sebanyak 270 pengguna tetapi rangkaian ini dibina pada 1998 dengan hanya 50 pengguna pada ketika itu namun dalam jangka masa 9 tahun bilangan pengguna telah mencapai jumlah 270 pengguna pada masa kini. Rangkaian komputer ini dibina berorientasikan perniagaan organisasi Tractors Malaysia Sdn Bhd. Objektif projek ini adalah untuk mengkaji dan menganalisa rangkaian tersebut untuk mengenalpasti masalah yang wujud dalam rangkaian tersebut. Beberapa kaedah telah digunakan untuk mendapat maklumat dan antaranya dengan menjalankan sesi temuduga, mengedarkan beberapa set soalan serta mendapatkan data dari ' monitoring tool ' yang digunakan dalam rangkaian . Setelah data dikumpulkan dan dapat mengenalpasti masalah kemudian akan dikhususkan kepada beberapa masalah yang specific. Seterusnya ialah mencari penyelesaian untuk masalah tersebut, dalam menentukan apakah penyelesaian yang didapati, data ini diperolehi daripada kajian literatur iaiti dengan menjadikan kes kajian yang telah dijalankan sebagai panduan. Setelah mendapat penyelesaian yang sesuai , satu design rangkaian akan dikemukan sebagai penyelesaian kepada masalah yang difokuskan. Design ini akan di simulasilasikan untuk mempasti bahawa design tersebut memenuhi kriteria serta menepati objektif project. Simulasi software yang digunakan ialah OPNET Modular.

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CHAPTER I

INTRODUCTION

1.1 Project background

This project is regarding network analysis and network design of the network in an organization whereby it is more to study and analysis the networking management in the organization. The organization that is chosen is Tractors Malaysia Sdn Bhd. The nature of this organization business is as distributor of heavy vehicles and machineries whereby this organization was actually started in Malaysia by the investors from Hong Kong and at the moment the head quarters is situated in Puchong, Selangor where there is approximately 270 employees are working in the head quarters only. These organizations do have a business network covering Malaysia where there are branch placed in every state in Malaysia including Sabah and Sarawak.

This is a well established organization as it was first started in the early 1920`s that has operating till today yet it has been just 10 years back the organization has given importance to Information and Communication Technology. At present the network in the head quarters alone covers approximately 250 users without including the network of the branches. The main purpose of the network in this organization is used for data management and e-mail base since the employees often correspond with their alias abroad. A number of systems are running in the network which is used by different level

of users as in the users are divided into different groups according to the access privilege that is granted to each user.

This project will be focusing on the network performances and system performances of the existing network and from the data's collected through analysis and study will be compared the overall performances level in the existing network. The output of the project will be finding the causes of errors and faults in the network and then to come up with a almost perfect network layout that will be able to provide a much better service to the users.

1.2 Problem statement

The behavior of the network is regarding data management where its main activity in the network is to input data, process data, to display required data and to retrieve back data that is requested by the user. All the process above will take place in the main server where the entire data that is input in the network will be retrieved and saved in this particular server. The problem that is faced here is where the users face difficulties in retrieving data from shared folder and also gaining access to a shared folder.

The other problem faced by the users is they are at times can only save documents or other related file in shared network only. This causes a hassle because the need to access again into this shared network in order for reference and this process takes time therefore it is much convenient if the users can save the file in private folder but this attempt is at times denied. There are many possibilities for problems to occur in the network because of data management process such as the could be lost of data of a certain period and at times the server might be able to fulfill the users requirement as in

the server might not be able to perform the particular task requested by the user, one of the most common problem is the connectivity between the server and the user disconnects where it causes the lost of data whereby the raw data input by the user at that particular period will not be saved in the server .

The most important part of a network is the setting and configuration of the router, switch and the cables that is used in the network. All this will affect the performances of the network as in it will determine the speed of the data flows in the network. It is important to know the capability and the capacity of these equipments whether it is able to support and fulfill the users' requirement therefore if any of these equipments have faults it will effects the performances of the network where it also effects the system performances indirectly.

The most common problem that is caused because of the faults in these equipment is the connectivity of the network will be disrupted which it causes the flow of the data blocked from one node to another node in the network and also the connectivity from one node to another node will be disrupted too. All this will cause other problems that will affect the performances of the user in the network where the user might be able to perform their daily task. Since the network consist of more less 250 users therefore it is very important to choose the right equipments in order to allow the daily task of the users to be carried out smoothly.

Even though the main purpose of the network in more towards data management yet e-mail management seems to be equally important too as the users correspond with their abroad business alias in order to get business feedback therefore this shows the usage of internet plays an important role in the network, yet the usage of internet causes many problems where one of the most common problem is the virus attack. Once there is a virus attack in the network, it will spread to all the node that is connected to the network and the motive of virus is to corrupt the operating system and data's in the computer. It is important for the administration to take precaution on this matter as in the users need

to be briefed on how important to manage internet and how can the user prevent all this hazards.

1.3 Objective

- Analysis the existing system, LAN of Tractors Malaysia Sdn Bhd.
  It is one the most important part of the project because through analyzing the existing network, the purpose and the models in the network will be known. This information is very crucial for the project because this information will the basic information to start of this project as in it determines which factor to be focused.

- Collect data and define the problems that are faced.
  Data collection will be done base on what are the factors that is being looked in this project and also what is the effective method to collect data which could be either preparing a questionnaire to certain group of users or either by interviewing IT staff in order to get a detail information regarding the existing network

- Find the root of the problem and then the solution for each problem.
  The data collection is done mainly to identify what are the problems in the existing network and what are the effects of those problems in the network. Through this method, it will be easy to prioritize the problems then it will be possible to narrow down to a particular problem base on effects and how important it is to find the solution for that problem.

- Propose a new design which will be implemented through simulation.
  The output of this project will be the proposed new design which is suppose to achieve the required objective and scope of the project. This new design will be tested on a simulation tool first before being implemented for real therefore it is important to obtain the appropriate simulation tool so that it can produce the expected feedback

1.4 Scope

- User target – users of Tractors Malaysia Headquarters
  The target user of this project will be the users of the existing network of Tractors Malaysia. The current network in the headquarters of Tractors Malaysia has 270 users from different levels privileges to use the network in order to perform the daily task of the business

- Tractors Malaysia network
  The scope of this project is only the network of Tractors Malaysia headquarters. This project is only focused on the existing network of the headquarters of Tractors Malaysia whereby the projects analysis and design is only about the current network of Tractors Malaysia.

- Enhancement of existing network
  Enhancement of the existing network of Tractors Malaysia will be done from the information collected and analysis of the existing network. Base on the output that is gained from the analysis of collected data a new network design will be proposed which will be the solution of the problems in the existing network.

- Analysis – simulation

  Simulation of the proposed network will be done to confirm that the proposed network meets the expected requirement and objective of the project and simulation will justify the proposed design before it could be implemented for real. Simulation tool that will be used in this project is OPNET MODELER .

- Limitation of the project – network performance

  This project will be focusing on the network performance of the network of Tractors Malaysia particularly on the downtime and traffic congestion in the existing network. The cause and the effect of this problem will be identified in the project and then solution fro the problem will be proposed. This will be proposed as the new network design.

1.5 Project significance

Once the network of this organization is enhanced then the users might not face the current problems as the faults have been detected and fixed. Through analysis of the network will be able to find the cause of the problems that occurs and with this information a better network can be design for the users.

1.6 Expected output

The project main output is the enhanced network design from the existing network of the organization. The new network design should be the solution for the problems that exist in the current network which means the implementation of the new network design should be able to improve the productivity of the business.

1.7 Conclusion

Basically this in this chapter, a brief description about the organization has been explained including an overall explanation regarding the general task that is carried out by the users in the network. The main purpose of the network in the organization as in more to data management and e-mail correspond with foreign alias as for business purpose. Overall details about the problems faced by the users in the existing network and what are the effects of these problems to the business and the users of the organization. Therefore the output of the project will be focused to the users of the organization as in the enhancement of the existing network will give advantage and provide a better network environment for the users to carry out their daily task in the organization.

CHAPTER II

LITERATURE REVIEW AND PROJECT METHODOLOGY

2.1 Introduction

This chapter describes how fact findings can be related to the project where it gives a better understanding regarding the methods and the information that need to be collected in order to do this project.

2.2 Facts and finding

Fact finding is an extremely important component of the communication process which presents its own special set of problems and opportunities to people working to increase the constructiveness of intractable conflicts. Facts are pieces of information that can be independently verified by generally accepted research methods as reliable and a sound bases for decision making and dispute resolution. Facts may involve technical questions such as: the number of people living in a particular area, number of acres of land under irrigation, the cost of constructing and supplying a refugee camp, risks associated with a chemical plant, or the amount of money that a company can afford to pay its employees and still remain competitive.

Fact and finding in here was done on journals, related case studies and information of tools that will be needed to do this case study. Base on information that is collected this case study will be done

2.2.1 Domain

The domain related to this project is ICT in Education and Training which will be specifically on Networking and Distributed Computing. This is because this case study will be on research and solution therefore it will be more on information that will be gained through the research which will produce the product of the project.

2.2.2 Existing System

Literature review gives an idea on how to approach this project and what are the possible methods that will appropriate to be implemented in order to achieve the desired output of this project. Since the project is an existing enterprise network of Tractors Malaysia Sdn Bhd therefore the first and foremost step is to gather information about the existing network where several factors must be taken note and considered such as what are the services that is provided in the existing network to the clients, analyze the possible traffic pattern in order to know what are the current problem faced by the existing network and how crucial is the effect to the enterprise business. Through this it is easy to prioritize the defects base on the importance to rectify the problem and also whether to keep the current protocol or upgrade to a different protocol.

Logical design is important to illustrate the flow of data in the existing network because logical design defines how the data flows from end – to end user and what the nature of the existing network in Tractors Malaysia [1].In order to come up with a network design, there are a few steps that need to be followed to produce a better design where the first step will be the requirement analysis which it gives a better understanding of the probable behavior or the network that need to be design. The information that get to be collected through requirement analysis are informed choices of network and technologies which is more objective, networks and components that will be properly sized to fulfill the requirements of users and application and finally to decide the better choice of interconnection strategies .

Next will be the user requirement analysis because findings through user requirements play the most important role on deciding the network behavior. The information that needs to be found is the security level in the network as it determines the guarantee of the integrity of the user's information and physical resources. Besides it is important to know what will be the affordability level expected by the users, numbers and location of the user and finally what is the expected growth in the future. Finally is the network requirements analysis itself where it is crucial to know the constraints imposed by the existing network where these information need to be noted such as the scalability, concentration of host , users and application in the network, existing network layer and the supported services and current service level [2].

The information that is gained from the above analysis will give a view on deciding the type of design that should be done either to do a new design or to upgrade the existing design, then to decide on the scope of the project such as the network size and finally are the constraints that need to be considered in the project such as the funding limitations, organizational rules and technical constraints, all these information will be able to decide what are the best approaches and considered solution that will help to achieve the design goal. There is a need to implement methodology in the project for