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Design of local area network at the laboratory of sma 2 pgri palembang

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A B S T R A C T

Currently, the laboratory uses computers and LAN networks as school practical tools. During initial observations at SMA 2 PGRI Palembang, they found a problem, namely the large number of students and the lack of learning facilities to carry out activities in the computer room resulting in some students not being able to fully study in the room. computer due to the limited time for students to learn. In developing the system, the author will use the Network Development Life Cycle (NDLC) method for designing lan network infrastructure. Network Development Life Cycle (NDLC) is a method that relies on previous development processes such as business strategy planning, application development life cycle, and data distribution analysis. And can provide an overview of the design of computer network systems that in the future can be used as a reference for building a computer network that is good and efficient and easy to implement.

I. Introduction

The rapid development of technology has brought humans into life side by side with information and technology itself. Which has an impact on some people to leave the process of searching for information manually which takes longer to get or find the information they want. With information technology that is currently developing, information management can be carried out in a more actual and optimal manner. The use of information technology aims to achieve efficiency in various aspects of information management, as indicated by the speed and speed of processing time, as well as the accuracy and precision of information.

A computer network is a telecommunications network that allows computers to communicate with each other by exchanging data, the goal is that every part of the computer network can request and provide services.

Network service or network service is a service to accommodate network needs and internet access as well as handling network and internet disturbances. This service itself is provided by a computer network whose function is to provide convenience in using shared resources both software and hardware to achieve the same goal, each part of the computer network will request or provide services. The party that requests or receives the service is called the client and the party that provides or sends the service is called the server. This design is called a client-server system and is used in almost all computer network applications.

Currently, the laboratory of Senior High School 2 PGRI Palembang has been using computers and local area network networks as school practical tools. During initial observations at SMA 2 PGRI Palembang, they found problems, namely the large number of students and the lack of learning facilities to carry out activities in the computer room resulting in some students cannot study fully in the computer room because of the limited time that students are divided into. Based on the problems that the authors found when conducting initial observations, the authors were interested in overcoming these problems and making a study about "Designing Local Area Network Infrastructure at the Computer Laboratory of SMA 2 PGRI Palembang".

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II. Method

2.1. Data Collection Method

To obtain the data needed in this study, the authors used data collection techniques consisting of three stages including observation, interviews, and literature study.

Observation Method

Observation is a method or technique of collecting data by making direct observations of an object to be investigated. Observations are carried out by making direct observations at the computer laboratory of SMA 2 PGRI Palembang.

Interview

Interview is a process in obtaining a description of the research objectives which is carried out through face-to-face question and answer between the interviewer and the respondent or the person being interviewed. Conducting questions and answers with the head of the computer laboratory of SMA 2 PGRI Palembang which was carried out systematically to collect the data needed to solve the problems found.

2.2. System development method

In developing the system, the author will use the Network Development Life Cycle (NDLC) method for designing lan network infrastructure. Network Development Life Cycle (NDLC) is a method that relies on previous development processes such as business strategy planning, application development life cycle, and data distribution analysis.

The following is the cycle of the NDLC:

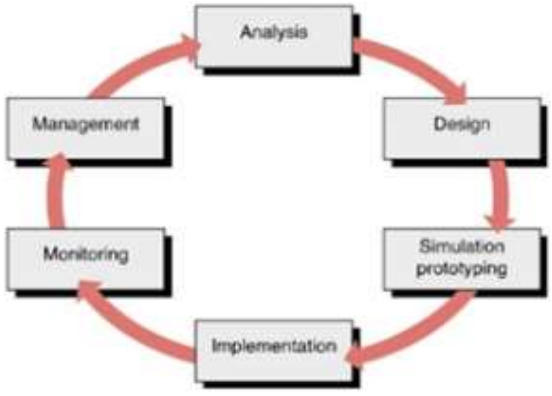

Figure 1. NDLC Method

- (Analysis) In this initial stage, needs analysis, analysis of problems that arise, analysis of user desires is carried out, and analysis of the current network topology.
- (Design) From the data obtained previously, this design stage will create a design drawing of the interconnection network topology to be built. It is hoped that this image will provide a complete picture of the existing needs. The design can be in the form of a topological structure design, data access design, cabling layout design, and so on which will provide a clear picture of the project to be built.
- (Simulation Prototype) Some network workers will create a simulation with the help of special tools in the field of networking such as Boson, Packet Tracert, Netsim, and so on. This is intended to see the initial performance of the network to be built and as a presentation and sharing material with other team work. However, due to the limitations of this simulation software, many network workers only use packet tracer tools to build the topology that will be designed.
- (Implementation) This stage will take longer than the previous stage. In the implementation of network workers will implement everything that has been planned and designed previously. Implementation is a very decisive stage of the success/failure of the project to be built and at this stage the team work will be tested in the field to solve technical and non-technical problems.
- (Monitoring) After the implementation of the monitoring stage is an important stage, so that the computer network and communication can run in accordance with the wishes and initial goals of the user in the early stages of analysis, it is necessary to carry out monitoring activities.
- (Management) At the management or regulatory level, one of the issues of particular concern is policy. Policies need to be made to make/regulate so that the system that has been built and runs well can last a long time and the element of reliability is maintained. The policy will depend on the management level policy and the company's business strategy. IT as much as possible should be able to support or alignment with the company's business strategy.

2.3. Research Framework

In this method the author provides an overview of the steps that cover from the beginning of the study to the end of the study so that the research carried out can be carried out in a structured and systematic manner, it is necessary to develop a framework. Each stage in the framework is then explained how to do it.

The description of the framework in this research is a detailed description of each framework that has been prepared so that the research carried out can be carried out in a structured and clear manner.

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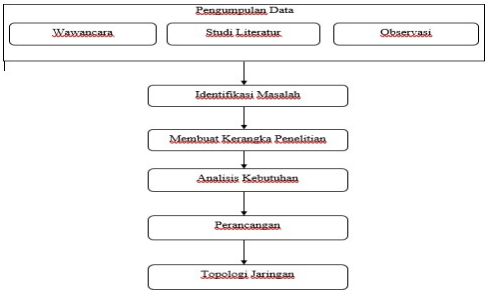

Figure 2. Research Framework

In the picture above, it is found that the framework of the research carried out is that the first author conducts data collection, at the data collection stage the author conducts 3 stages, the first is to conduct direct interviews, the second is to study literature through journals, books, and others. the last, the author made direct observations in order to find out the problems that exist in the object of research. After collecting data, the writer identifies the problem at hand, then the author makes a framework for this research and analyzes what needs are needed when the author conducts research to make a pre-final project report, then after analyzing the needs the author starts designing and making the appropriate network topology and needed.

III. Results and Discussion

3.1. Network System Design

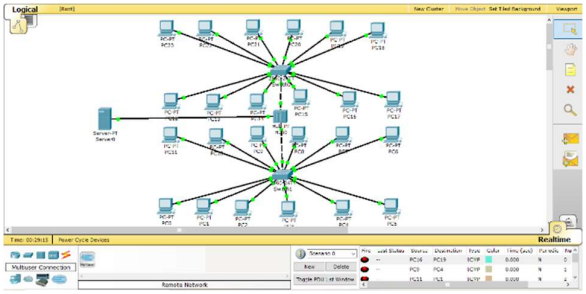

Figure 3. Network topology

In the picture above is a LAN network infrastructure design using a star topology using a packet tracer 5.0 application that has a unique design and is easy to develop.

3.2. Setting IP Address Configuration

How to set ip address:

1) First click the PC you want to configure the IP address for, then a new window will appear,
2) Then click the desktop tab,
3) A menu will appear, select IP configuration,
4) Fill in the static IP field with 192.168.1.15 and leave Gateway by default 255.255.255.0.

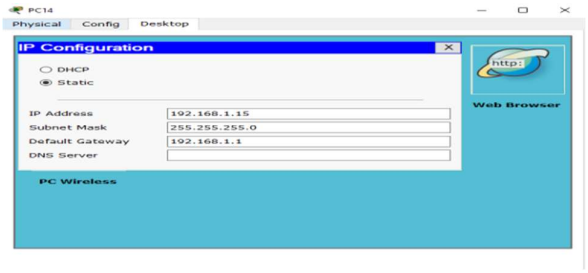

Figure 4. Configurasi

3.3. Test Ping using command prompt

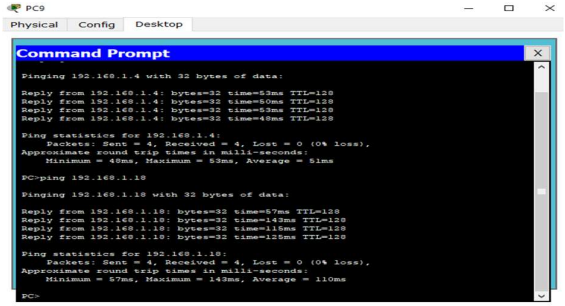

Figure 5. Test Ping

In the image above Command prompt is a command line interpreter application that is available in most windows operating systems. It is used to execute the entered command. The function of PING is to test the ability of the source computer to reach the specified destination computer. In the picture the author pings PC 18 by writing "ping 192.168.1.18" after that click enter and then a text like the one drawn will appear.

IV. Conclusion

From the results of the description of the previous discussion and the results of trials that have been carried out in research on the design of local area network network infrastructure at SMA 2 PGRI Palembang on Jalan Jend. Ahmad Yani, Lorong Gotong Royong 9/10 Ulu, Seberang Ulu I District, Plaju City Palembang, Sumatra Province South, it can be concluded as follows:

1) Produce a LAN network infrastructure design that can be applied at the research site.
2) Can provide an overview of the computer network system design in the future can be used as a reference for building a computer network that is good and efficient and easy to implement.

V. Suggestion

In designing a computer network system design, it is not just to design a need for a network in a place or agency, but more than that it requires an analysis of real needs and

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expectations from users of what will be designed and requires expertise and creativity from a designer. so that the design is good and useful for users.

Based on the research conducted, namely the design of the local area network network infrastructure at 2 pgri palembang high schools, until now it is still using a LAN network (Local Area Network) which only covers 1 area, until now the local area network network can only be accessed within computer lab only. It is hoped that further researchers who want to develop the network can include all laboratories and tools that are no longer used in computer laboratories to be installed in other laboratories.

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