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International Journal CISTER

| ISSN (Online) xxxx-xxxx |

Orange Institute

Design of computer network based on microtic router os in smp negeri 1 kota agung

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ARTICLE INFORMATION

Article History:
Received: 13 January 2022
Final Revision: -
Published *Online*: 01 April 2022

KEYWORDS

Computer network
Mikrotik
LAN
Packet Tracer

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A B S T R A C T

SMPN 1 Kota Agung Lahat Regency is one of the junior secondary level public education institutions in the Lahat area. To support teaching and learning activities at SMPN 1 Kota Agung requires accurate and fast information in supporting services for their students. Currently SMPN 1 Kota Agung is not optimal in utilizing the Kant of technology to support teaching and learning activities, currently SMPN 1 Kota Agung is still experiencing difficulties in carrying out online teaching and learning activities due to the unavailability of an adequate internet network, this causes delays in sending assignments given by teachers to students which students have to come to school. In addition, there are obstacles experienced by the school in terms of sending reports to Dapodik because of this internet network problem as well. There are also other problems that exist at SMPN 1 Kota Agung in transferring data or files on each computer still using hardware such as Flashdisk, USB, this is vulnerable to the exchange of computer viruses who attacked the computer at SMPN 1 Kota Agung. Therefore in need a system to support this process by building and developing a local area network (LAN) and wireless fidility (WiFi) design. For this reason, the researchers conducted a study entitled "Designing a Computer Network Based on Mikrotik Router OS at SMP Negeri 1 Kota Agung" with the aim of making a computer network design available that can be implemented in SMP Negeri 1 Kota Agung.

I. Introduction

A computer network is a set of interconnecting a number of computers automatically. It is explained that a computer network is several computers (and others such as routers, switches, and everything) that are interconnected with each other through media intermediaries. The intermediary media can be wired media or wireless media (wireless). Information in the form of data will flow from one computer to another or from one computer to another, so that each connected computer can exchange data or share hardware devices [1].

LAN stands for Local Area Network. LAN consists of several computers connected in a network. At this time, any computer can access data from other computers. In addition, computers can access data from other computers. In addition, computers connected to a LAN can also run hardware such as printers from other computers, chat with other computer owners, or play games together. The number of computers connected to the LAN is relatively small, for example, computers at home, internet cafes, boarding houses, and several other places where the computers are included in the LAN, which are in one building. Each computer connected to a LAN has a different IP address [2].

WIFI (Wireless Fidility) is a variant of information and communication technology that works on Local Area Network (WLAN) wireless networks and devices. As the name implies, the devices needed to access the internet with this service are also wireless. When compared to other internet, WIFI is easier to install. However, of course there must be a main device such as wireless or access points and an internet network.

II. Method

In developing the system, the author will use the Network Development Life Cycle (NDCL) method for designing a network based on Mikrotik RouterOS at SMP Negeri 1 Kota Agung. The method consists of analysis, design, simulation prototype, implementation and. The following are the stages of the NDCL method as follows monitoring:

https://doi.org/10.56481/cister.v1i01.13

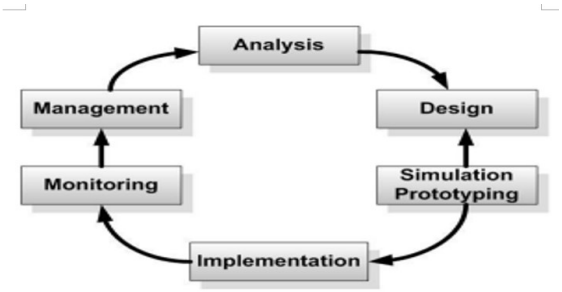


Figure 1. Model SDLC

a) Analysis stage. The initial stage in analyzing is user needs analysis, device requirements analysis, network requirements analysis, feasibility analysis, network topology analysis.
b) Design stage, this stage from the data obtained previously, this design stage the author will make a network topology drawing design to be built, data access design and so on.
c) Prototype Simulation Stage, This stage develops a network that will be made in the form of a simulation with the help of GNS3 tools.
d) Implementation stage, this stage will take a little longer. In carrying out the implementation, the author has implemented everything that was planned and designed previously. At this stage it will be seen how the development that will be built will have an influence on the existing system.
e) Monitoring stage, this stage has been implemented. The monitoring stage is an important stage so that the network and communication can run according to the wishes and objectives of the author in the early stages of the analysis.
f) Management stage. At this stage, one of the things that gets special attention is policy issues, namely in terms of activities, maintenance and management, they are categorized at this stage. Policies need to be made to create and regulate so that the system that has been built and runs well can last a long time and the element of reliability is maintained.

III. Results and Discussion

3.1. Network Topology

In designing the LAN network architecture, a topology is needed, which describes the structure of a network or how a network is connected. In the network at SMP N 1 Kota Agung Lahat Regency, Star Topology.

Star topology or star topology is a method or way to connect two or more computers with a star-shaped network (star), where the network topology is in the form of convergence from the middle node to each node/user, so that all nodes or points are connected to the middle node. Named as a star topology because by design the assembly resembles a star shape with a central server in the middle.

3.2. Network System Design

The following is an image of a local area network network design which uses a star topology. network design scheduling is done by estimating using 3 switches, 9 computers and 3 routers where the first router is a server, the second router is a device, where each switch is connected to 3 computers. Each computer has an IP address with the same class and members.

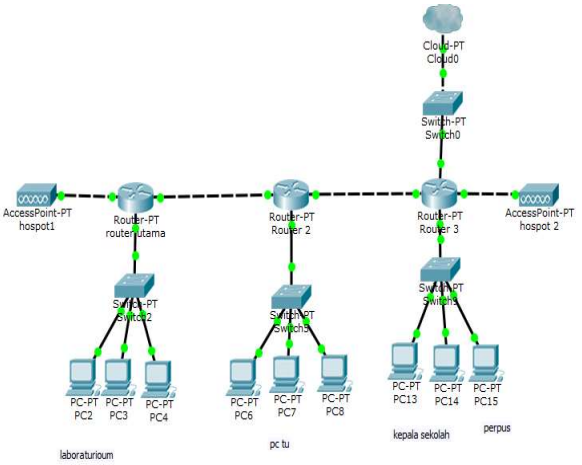
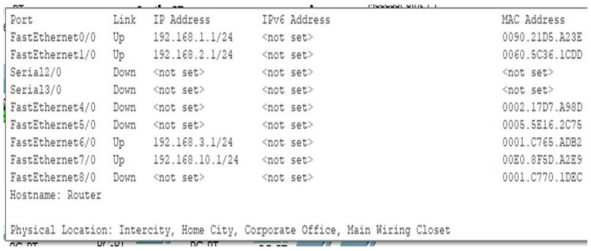


Figure 2. Local Area Network (LAN) Design

Main router ip



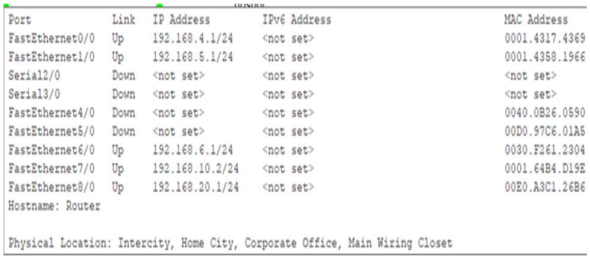
Port	Link	IP Address	IPv6 Address	MAC Address
FastEthernet0/0	Up	192.168.1.1/24	<not set>	0090.21D5.A23E
FastEthernet1/0	Up	192.168.2.1/24	<not set>	0060.5C36.1CDD
Serial2/0	Down	<not set>	<not set>	<not set>
Serial3/0	Down	<not set>	<not set>	<not set>
FastEthernet4/0	Down	<not set>	<not set>	0002.17D7.A98D
FastEthernet5/0	Down	<not set>	<not set>	0005.5E16.2C75
FastEthernet6/0	Up	192.168.3.1/24	<not set>	0001.C765.ADB2
FastEthernet7/0	Up	192.168.10.1/24	<not set>	00E0.8F5D.A2E9
FastEthernet8/0	Down	<not set>	<not set>	0001.C770.1DEC

Hostname: Router

Physical Location: Intercity, Home City, Corporate Office, Main Wiring Closet

Figure 3. Main router ip

IP Router to 2



Port	Link	IP Address	IPv6 Address	MAC Address
FastEthernet0/0	Up	192.168.4.1/24	<not set>	0001.4317.4369
FastEthernet1/0	Up	192.168.5.1/24	<not set>	0001.4358.1966
Serial2/0	Down	<not set>	<not set>	<not set>
Serial3/0	Down	<not set>	<not set>	<not set>
FastEthernet4/0	Down	<not set>	<not set>	0040.0B26.0590
FastEthernet5/0	Down	<not set>	<not set>	00D0.97C6.01A5
FastEthernet6/0	Up	192.168.6.1/24	<not set>	0030.F261.2304
FastEthernet7/0	Up	192.168.10.2/24	<not set>	0001.64B4.D19E
FastEthernet8/0	Up	192.168.20.1/24	<not set>	00E0.A3C1.26B6

Hostname: Router

Physical Location: Intercity, Home City, Corporate Office, Main Wiring Closet

Figure 4. Ip router to 2

E-ISSN : xxxx-xxxx

https://doi.org/10.56481/cister.v1i01.13

IP Router to 3

Port	Link	IP Address	IPv6 Address	MAC Address
FastEthernet0/0	Up	192.168.7.1/24	<not set>	000C.85ED.24D6
FastEthernet1/0	Up	192.168.8.1/24	<not set>	0001.979C.B5D0
Serial2/0	Down	<not set>	<not set>	<not set>
Serial3/0	Down	<not set>	<not set>	<not set>
FastEthernet4/0	Down	<not set>	<not set>	0001.C78A.0E8A
FastEthernet5/0	Down	<not set>	<not set>	00D0.BC34.EB41
FastEthernet6/0	Up	192.168.9.1/24	<not set>	0010.1114.A934
FastEthernet7/0	Up	192.168.20.2/24	<not set>	00D0.FF1D.152E
FastEthernet8/0	Up	192.168.30.1/24	<not set>	0050.0FAC.921A

Hostname: Router

Physical Location: Intercity, Home City, Corporate Office, Main Wiring Closet

Figure 5. Ip router to 3

IP address on PC

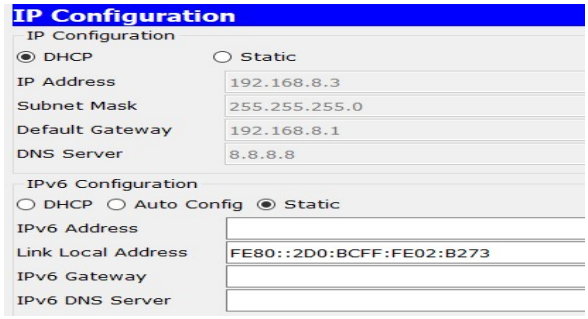


Figure 6. Ip address on PC

to see the ip address click fc then select desktop then select ip configuration

Ping test results on 2 to 3 PC

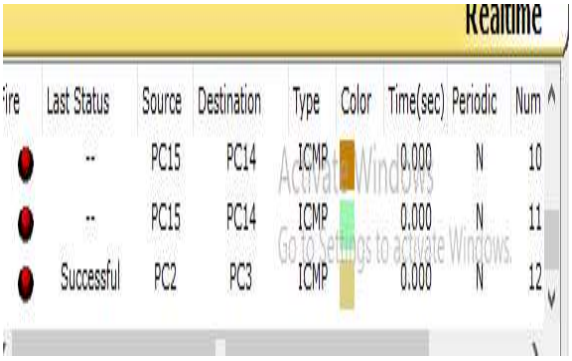


Figure 7. PC 2 to 3

PC 4 ping test results to router 1

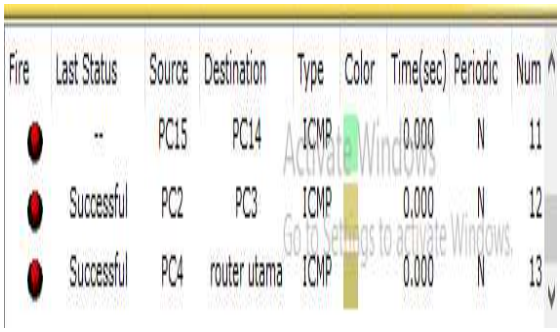


Figure 8. PC 4 to router 1

Test reset IP from client computer

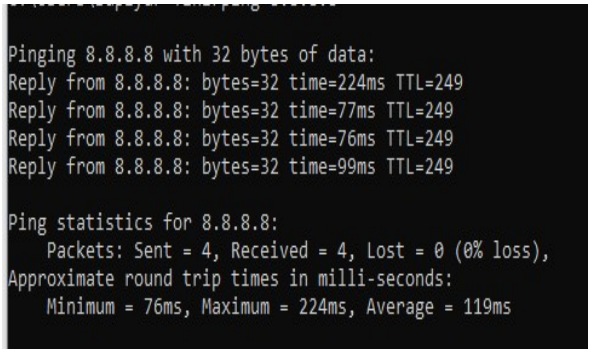


Figure 9. Test Request IP Computer Client

IV. Conclusion

From the results of the previous description and the results of the voba tests that have been carried out in this study, it can be said as follows:

1) the design of a LAN and WIFI area computer network based on a mikrotik router that can be implemented in SMP 1 Kota Agung.
2) Simplify the Mikrotik hotspot login system in maintenance and monitoring because all users are seen on Mikrotik.

V. Suggestion

Suggestions that can be described in the following developments include:

1) Requires network administrator to monitor network server (mikrotik router board) activity that is running.
2) For the development of further research, it is expected to conduct case studies of the problems presented

https://doi.org/10.56481/cister.v1i01.13

E-ISSN : xxxx-xxxx

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E-ISSN : xxxx-xxxx

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