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Implementation of File Sharing and Remote Desktop Connection (RDC) by Utilizing Local Area Network (LAN)

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ABSTRACT

The exchange of information between devices in a network is very important for efficiency and collaboration. One technology that supports the exchange of information is File Sharing and Remote Desktop Connection (RDC). This research aims to implement these two technologies in a Local Area Network (LAN) to facilitate file exchange and remote access to computer desktops. Implementation begins with a stable and secure LAN network configuration. Then, using file sharing protocols such as SMB (Server Message Block) or NFS (Network File System), users can share and access files between devices on the network easily. Additionally, by utilizing the Remote Desktop Connection service, users can access a computer's desktop remotely from other devices on the network, allowing for efficient system administration as well as access to applications and files located on that desktop. The implementation methods used include configuring network settings, installing and configuring file sharing software and Remote Desktop Connection services, as well as testing to ensure optimal connection and security. The results of this implementation are expected to increase productivity and collaboration in a LAN environment by enabling easy and secure access to files and computer desktops from various locations on the network.

I. Introduction

As network technology develops, it increasingly provides convenience between computer users, with computer networks, data transformation between computers can be done easily and quickly. Therefore, effectiveness and efficiency can be achieved which ultimately results in higher productivity. Computer technology has penetrated various fields including education. Computer facilities really help administrative work processes and student information services. A computer network is a system consisting of computers, software and network devices that work together to achieve a common goal. In order to achieve the same goal, each part of the computer network requests and provides services. Implementing file sharing and Remote Desktop Connection (RDC) by utilizing a Local Area Network (LAN) network is one solution to meet these needs.

File sharing allows users on a network to easily share files and resources such as printers and other devices. This not only improves work efficiency but also reduces the need for physical storage media and additional hardware. On the other hand, RDC allows users to access and control other computers remotely, which is very useful in situations where physical access to a computer is not possible or practical. Regarding problems that often occur in the form of a lack of information regarding the

delivery of data and information that is not yet systematic because it still uses external storage media (flash disk, hard disk), the development of Local Area Networks (LAN) can be applied in sending data periodically and by using LAN network services, Likewise, the LAN network can be used as a computer connector to carry out Remote Desktop Connection (RDC).

The LAN design uses a UTP cable connecting media that is connected to several computers via a hub, this is to facilitate data communication and remote control that takes place on the LAN network. The LAN network can also be connected to the internet via a modem with bandwidth sharing so that data usage can be used optimally and according to user needs. The availability of a computer network in the form of a Local Area Network (LAN) is expected to be used as a data transfer medium between computers and networks related to education. By utilizing LAN as network infrastructure, these two technologies can be implemented at relatively low cost and with high speed and reliability. LAN provides fast and stable connectivity between devices in a limited geographic area, such as within a building or campus. Apart from that, the use of a LAN also allows for easier and centralized network management and settings.

However, the implementation of file sharing and RDC is not without challenges, especially in terms of security. Threats to data privacy and potential unauthorized access are issues that need to be addressed with stringent security arrangements and ongoing monitoring. Additionally, training users on how to use this technology safely and effectively is also essential. Therefore, this research was conducted to explore various aspects of implementing file sharing and RDC in LAN networks, including methods, protocols, security challenges, and the benefits that can be obtained. With a deep understanding of this topic, it is hoped that you can make a significant contribution to improving operational efficiency and collaboration in work environments that utilize local network technology.

several studies on networks, including the first about MAC Address [1]. Secondly regarding the use of wireless networks[2]. The third is the use of LAN in the Kawangkoan area[3]. Fourth, the use of a LAN network uses a router[4]. Fifth, use the LAN network for data transactions[5]. Sixth network analysis using Wireshark[6]. Seventh use of virtual LAN networks[7]. Eighth, the use of LAN networks to improve services at a company[8]. Ninth, the use of LAN networks to improve services at a hospital[9]. Tenth comparison of the use of IPV4 and IPV6 in a LAN network[10].

II. Method

This research uses a descriptive method with a case study approach to implement file sharing and Remote Desktop Connection (RDC) using a Local Area Network (LAN) network. The stages carried out in this research are as follows:

1. Literature Study:
    a) Conduct a literature review to understand the basic concepts and technologies related to file sharing and RDC.
    b) Review protocols and mechanisms commonly used in file sharing (such as SMB and FTP) and RDC (such as RDP and VNC) implementations.
2. LAN Network Preparation: Make sure all devices that will be connected to the LAN network are connected to the right switch or router. Configure static IP addresses or DHCP for each device on the network, adjusting as needed. Determine whether the network will use an Ethernet cable or a wireless connection (Wi-Fi), and ensure the settings are appropriate.
3. Installation and Configuration of File Sharing: Choose a file sharing protocol that suits your needs, such as SMB (Server Message Block) or NFS (Network File System). On each device that will share files, activate the file sharing service and specify the folder or directory to share. Grant appropriate access permissions to the user or user group that will access the file. Make sure security settings such as data encryption and user authentication are implemented correctly.
4. Remote Desktop Connection (RDC) Settings: Activate the Remote Desktop service on the computer that will be accessed remotely. Configure RDC security settings, including the users

permitted to access the desktop remotely and the type of authentication to be used. Determine the port to be used for the RDC connection, making sure this port is not blocked by a firewall or other security device in the network.

5. Testing and Testing: Perform tests to ensure that file sharing is working properly between all devices on the network. Test the Remote Desktop Connection connection to ensure that users can access the computer desktop remotely smoothly. Check network security by validating file sharing access permissions and RDC security settings. Continue to monitor network performance and security of file sharing and RDC connections regularly. Perform routine maintenance such as software and hardware updates, as well as repairs if problems are found in using file sharing or RDC.

III. Results and Discussion

Implementing file sharing and Remote Desktop Connection (RDC) on a Local Area Network (LAN) network is a strategic step in increasing operational efficiency and collaboration in the work environment. Before implementing, preparing the right network devices is very important to ensure that the system runs optimally and according to needs. The following outlines the network device preparation steps that need to be taken before implementing file sharing and RDC.

1. System Requirements Analysis
   a) Server PCs
   b) From Intel Dual Core Processor (2.6 Ghz) and above
   c) RAM 2GB and above
   d) Windows XP and above
   e) Hard disk 500GB and above
   f) PC Client
   g) From Intel Dual Core Processor (2.5 Ghz) and above
   h) RAM 2GB and above
   i) Windows XP and above
   j) Hard disk 500GB and above
2. Steps to Make a Lan Cable
   a) Cutting UTP cable
   b) Placement of the UTP cable into the RJ45 Connector
   c) Crimping UTP cables and RJ45 connectors with crimping pliers
   d) Testing the cable into the tester
   e) Testing the HUB switch
3. File Sharing Steps

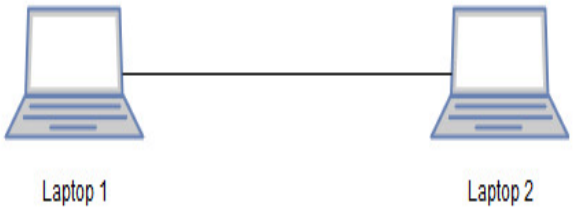

Fig 1. File Sharing

Steps for file sharing using a LAN network: Make sure both laptops are connected to the same network.

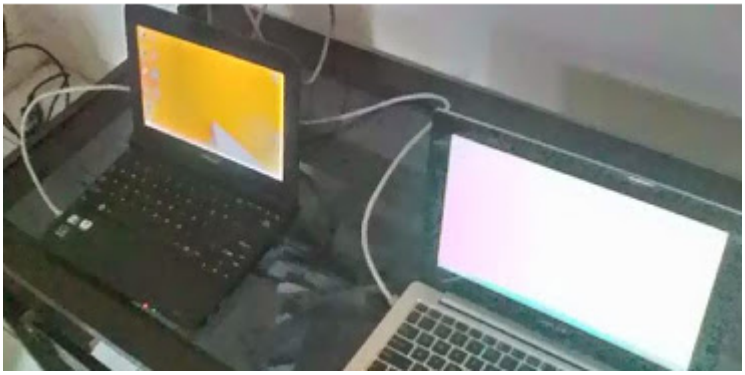

Fig 2. Network Sharing

Then on the computer right click on Open Network and Sharing Center.

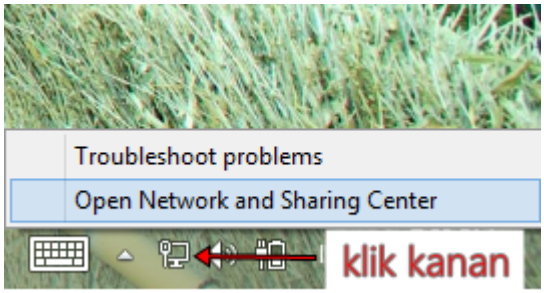

Fig 3. Local Area Connection

Then we click on ethernet, because in Windows 2010 the ethernet display will appear, if it is still Windows 2007 what will appear is "local area connection". After we select ethernet, the ethernet properties display will appear. In this display we will select the properties menu to select IPv6.

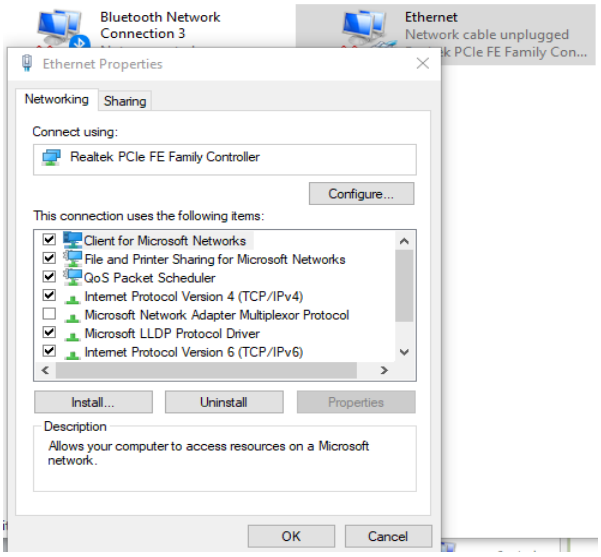

Fig 4. Ethernet

Then in the Figure 4 Ethernet properties display appears, then we select Internet protocol version 4 (TCP/Ipv6), then click properties. After step 5 is completed, a display like the one

below will appear, which functions to set up Laptop 1. In Figure 5, this is done by adding IPv6 192.168.1.1 with subnet 64 and the same default gateway as the IP given.

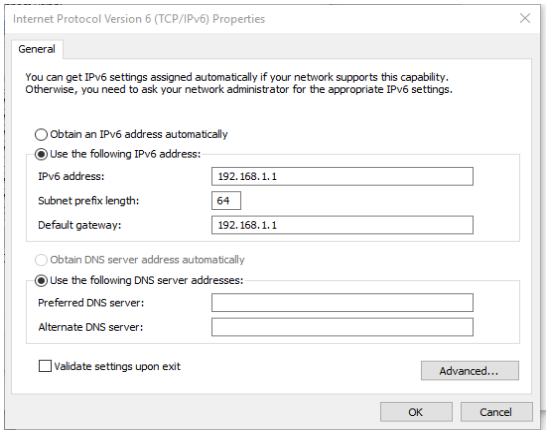

Fig 5. IP Laptop 1

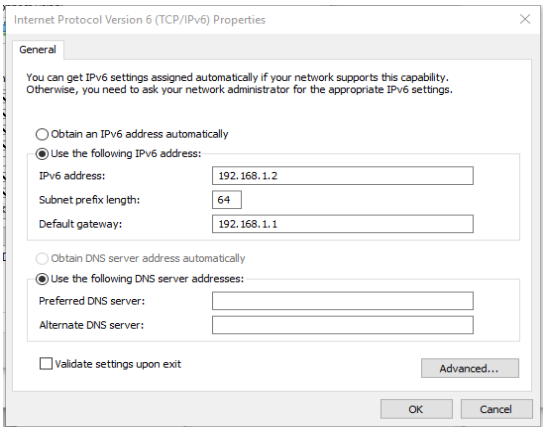

Fig 6. IP Laptop 2

After the connection is complete on laptops 1 and 2 as in Figures 5 and 6, the next step is to enter the file sharing stage, click change advanced sharing settings in the network and sharing center in the control panel. After a display like figure 7 appears, click save changes

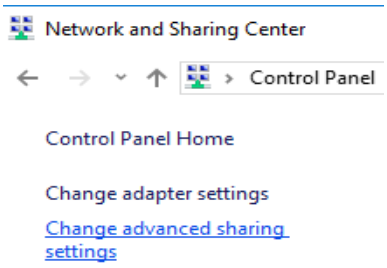

Fig 7. Network Sharing

4. Remote Desktop Connection (RDC) step

Steps to use remote desktop: Make sure remote desktop is active. Create a user first/use an existing user.

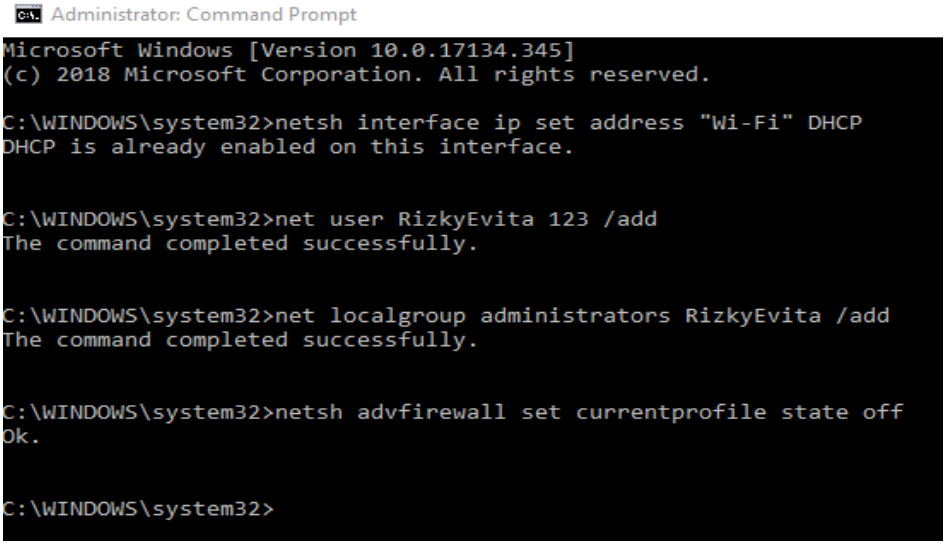

Fig 8. How to create a user

Activate the user (if a new user) on both laptops. Right click on This PC then click properties.

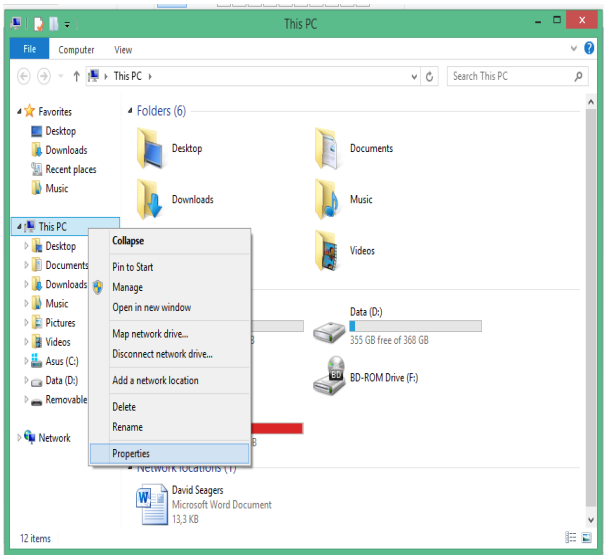

Fig 9. How to activate user 1

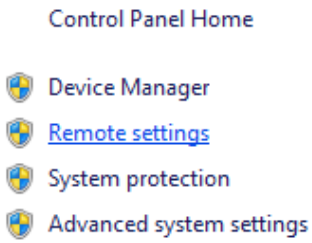

Fig 10. Choose remote sensing

After selecting Remote sensing on the control panel in Figure 10, where remote sensing is generally used in the use of remote sensor technology to monitor and control systems or processes via the control panel.

After Click Remote Settings in Figure 11 how to activate user 2. Follow the display below, then click select user and so on by adding many users.

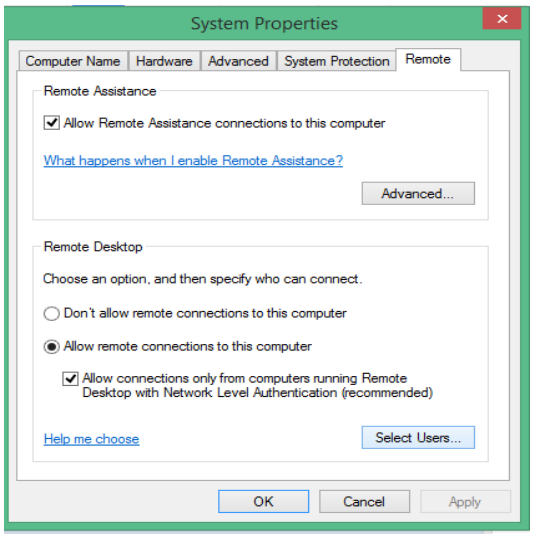

Fig 11. how to activate user 2

Open the remote desktop then enter the IP address and click connect. Then also enter the username and password and click OK.

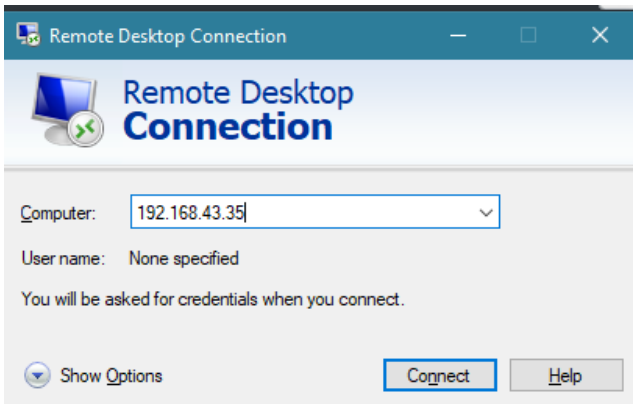

Fig 12. Login interface

Login interface and Enter the IP Address of the laptop you want to remote.

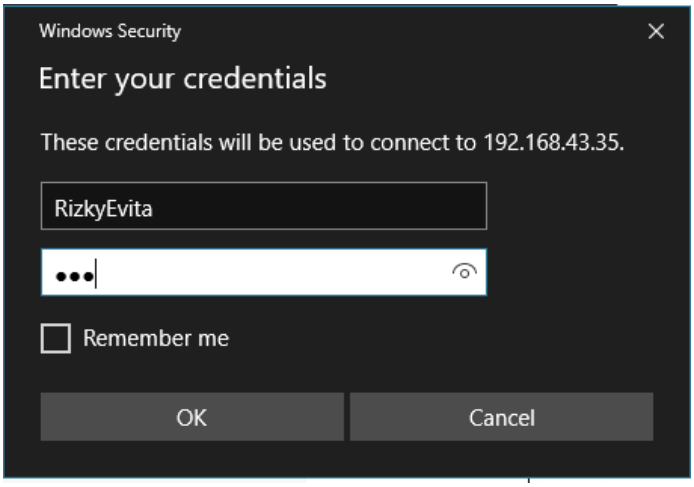

Fig 13. Enter username and password

Then click Yes on the following display. Then wait until the connection process is complete.

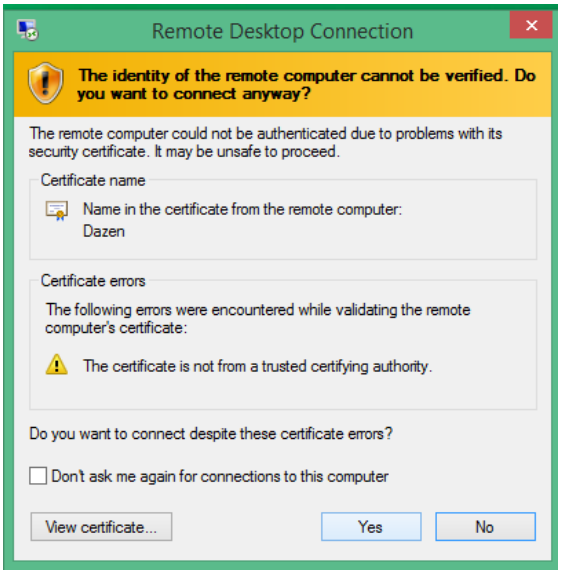

Fig 14 Remote Dekstop Connection

5. File Sharing Results

After carrying out the steps listed, Figure 15 below are the results of file sharing from Laptop 1 to Laptop 2.

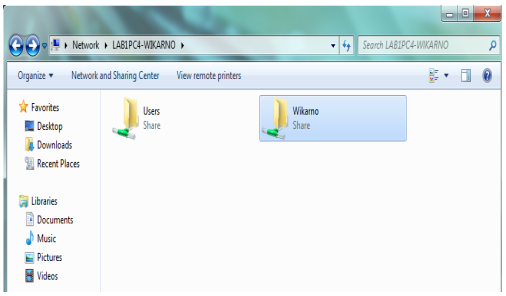

Fig 15. File Sharing Trial

6. Remote Desktop Connection (RDC) Results

The results of the Remote Desktop Trial can be seen in Figure 16 by carrying out the steps that have been listed where the remote desktop is from Laptop 1 to Laptop 2, because the one being remoted is laptop 2, the display on laptop 1 changes to the display on laptop 2. In Figure 16 above, the connection is in the form of a wireless adapter Local Area Connection with a specific DNS suffix connection with IPV4 192.168.43.35, subnet mask 255.255.255.0 and default gateway 192.168.43.1

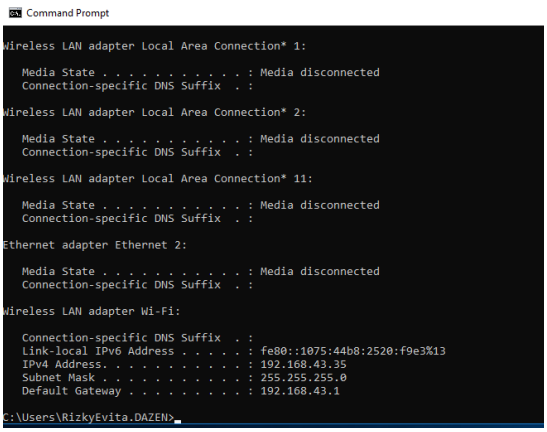

Fig 16. Remote Desktop Results

IV. Conclusion

Based on the tests that the author has carried out, it has been found that LAN networks have several functions that are very useful for use in everyday life or as new knowledge, it is known that in the process of file sharing and remote desktop, it is necessary to use a UTP cable so that PC A and PC B can be connected in the same network. Both PCs must input each of the IP addresses of the intended PC so that the file sharing and remote desktop processes are successful. Implementation of file sharing and RDC runs well on a LAN network that has been configured correctly. The use of quality network hardware and correct IP address settings ensures a stable and fast connection. Testing shows that file access from a client computer takes an average of 2 seconds, while the RDC connection has minimal latency, allowing for nearly the same user experience as direct access to the target computer.

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