International Journal of Information System & Technology
Vol. 3, No. 1, (2019), pp.64-72

Disk-Less Network Implementation using Cyberindo Program (Case: BAHONET2 Siantar Game Center)

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Abstract

The hard disk device used on the personal computer (pc) client at the game center, however, must have decreased durability because it is used continuously as in the BAHONET2 Siantar game center. This problem can be overcome with various solutions, but the authors prefer the diskless network method using the Cyberindo program as a solution to the problem. The author begins to design the diskless network in question, which is a windows-based application that is used to run, configure, and perform diskless processes through the server. Before the design is done, the authors identify problems that arise in the system that was previously used. This is done in order to avoid various errors on the old system in system implementation so that the results obtained are more optimal. After being implemented, the authors conclude that the diskless system using the Cyberindo program can reduce the use of local hard disks and also faster client performance, the client can be operated properly like using a local hard disk. Also there is no need to update the game manually on each client, we only need to update the game on the server so that all clients can automatically play the updated game.

Keywords: *Diskless Network, Cyberindo, Game Center.*

1. Introduction

A computer network or machine that can operate without the support of local storage media (storage or disk) is the understanding of diskless networks. This does not mean that the computer network does not have any storage media, but all existing data is stored on a diskless network server. Diskless network that is designed is intended to save the use of hard disks and minimize damage that occurs in computer devices, especially client computers at the game center given the duration of computer use at the game center is fairly long. The duration of the use of client computers is fairly long because most game centers operate almost 24 hours a day, this causes the hard disk endurance on client computers to decrease. This decrease in durability results in booting windows that takes a relatively long time or in modern terms is now (slow loading), constraints occur not only when booting windows but when opening other programs also occur slow loading and even not running at all.

Game updates on the previous system are still done manually, that is by one computer, this takes a long time and requires a large bandwidth so that the game update process runs smoothly. In the previous system it was also very difficult to find solutions to problems that exist on the client computer (troubleshooting), it takes extra effort to find solutions to problems that occur. Cyberindo is a program that can be run on the Windows 7 operating system, this program can facilitate the owner in patching/ updating games. With this program the game center owner only updates the game on the server and the game on the client computer is automatically updated. Using the diskless feature in the Cyberindo application program will facilitate and speed up the performance of the client computer in running the operating system and applications that run on it because they do not need

ISSN: 2580-7250 IJISTECH

another hard drive to be able to use the client computer. This is certainly very useful for game centers that have a large number of client computers. And as a substitute for the hard drive the server computer and other supporting devices are needed so that the client computer can carry out its functions as it should. This Cyberindo program can save costs such as computer repair costs and the cost of electricity used [1]. This can be proven through research conducted by researchers at the game center where researchers conduct research. The application program is simply installed on the server computer, then the client computer only runs the application and all processing activities are carried out by the server computer, therefore it requires server computer specifications that exceed the specifications of the client computer because the client computer's processing speed will follow the specifications of the server computer. Besides that, another convenience is obtained in terms of troubleshooting problems and also the ease of backing up data because the application program and data are centralized on the server computer.

2. Research Methodology

2.1. Computer network

Computer network is a combination of computer and communication technology which is a collection of computers which are not insignificant in number but are interconnected in carrying out their duties [2-3].

2.2. Types of Computer Networks Based on Function

a) Peer To Peer

This network type is used to connect one node point to another node. The type of peer to peer network allows a user to share resources on his computer in the form of data files, printers, and other peripherals. But this model does not have a file server or centralized resource [4-7].

b) Client Server

Client-server is the most widely used architecture today. This type of network allows clients to process themselves, when the client requests data, the server will send data as requested, then the process will be carried out at the client [8].

2.3. Diskless Network Concept

Diskless network is a computer or machine network that can operate without local storage media. This does not mean that the machine has no disk at all. All data is centralized and stored on one diskless computer network server [9].

2.4. Understanding Cyberindo Updater

Cyberindo Updater is a program to facilitate and accelerate game patching / update activities. The game center owner only updates the game on the server computer, then the client computer can immediately get an update without an internet connection again [10-12].

2.5. Problem Analysis

Before building a diskless network, the author first analyzes the problems that occur in the game center where the writer examines [13]. Here are the results of the analysis of the problem:

Tabel 1. Problem Analysis Table

No.	Item	Keterangan
1	Problems	a. Hard disks on the client are often bad sectors / damaged b. The game update process takes too long due to per-client updates
2	Cause	a. Continuous client use without breaks b. User usage that might cause the client to be infected with a virus c. Use the deepfreeze / shadow defender application

No.	Item	Keterangan
3	Solutions	Implement a Cyberindo diskless network system
4	Feasibility test	Test with the comparison of client with hard disk and client without hard disk

2.5. System Development Stage

For the development of this research system using the SDLC (Software Development Life Cycle) model. System Development Life Cycle (SDLC) is the process of making and changing a system and the models and methodologies used to develop a system. SDLC is also a pattern taken to develop a software system, which consists of the stages: plan, analysis, design, implementation, testing and management 14-15] as shown in the following figure:

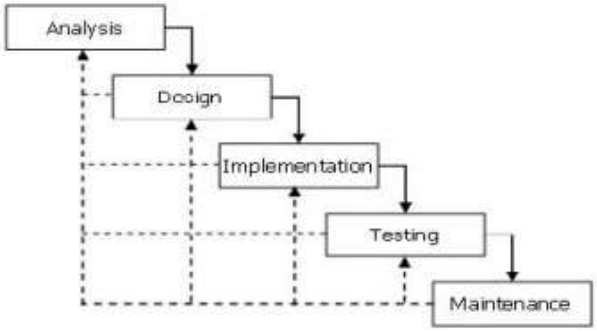

Figure 1. Waterfall method

3. Results and Discussion

3.1. Mikrotik Installation Design

The following is a test of the system implementation that has been made to find the desired results. The test is carried out using a personal computer (pc) and each Winbox application has been installed with the Windows 7 ultimate operating system which will be used as a client. Researchers use IDM (Internet Download Manager) and CBN Speedtest to measure the size of the bandwidth received by each client. Queue tree method in bandwidth management that is made to limit bandwidth on a proxy that has 2 internet connections. Because the packet mark is more functional than the simple queue used.

Following is an explanation of the queue tree configuration:

a) Parent: Useful to determine whether the selected queue is in charge of child queue.
b) Packet Mark: Used to mark packets that have been marked on / ip firewall mangle.
c) Priority (1 to 8): Used to prioritize child queues from other child queues. Priority does not work on parent queues.
d) Queue Type: Used to select the type of queue that can be made specifically in the queue types section.
e) Limit At: Minimum bandwidth obtained by the target or queue ip.
f) Max Limit: Maximum bandwidth that can be reached by the target or queue ip.
g) Burst limit: The maximum bandwidth that can be reached by the target or ip queue when the burst is active.
h) Burst time: The time period in seconds, where the average data rate is calculated.
i) Burst Threshold: Used when the data rate is below the burst threshold value, then bursts are allowed. When the data rate is equal to the burst threshold burst value is prohibited.

3.2. Mangle Configuration

The Mangle configuration is used as a rule on bandwidth restrictions. Queue Tree uses two marks, namely mark connection and mark packet. Configurations will be made for Upstream (Upload) and Downstream (Download). After making a mangle to upload and download for the entire bandwidth that will be shared with the client later. Furthermore, making mangle upstream and downstream for clients that will be limited bandwidth. The following mangle configuration images are designed in this study.

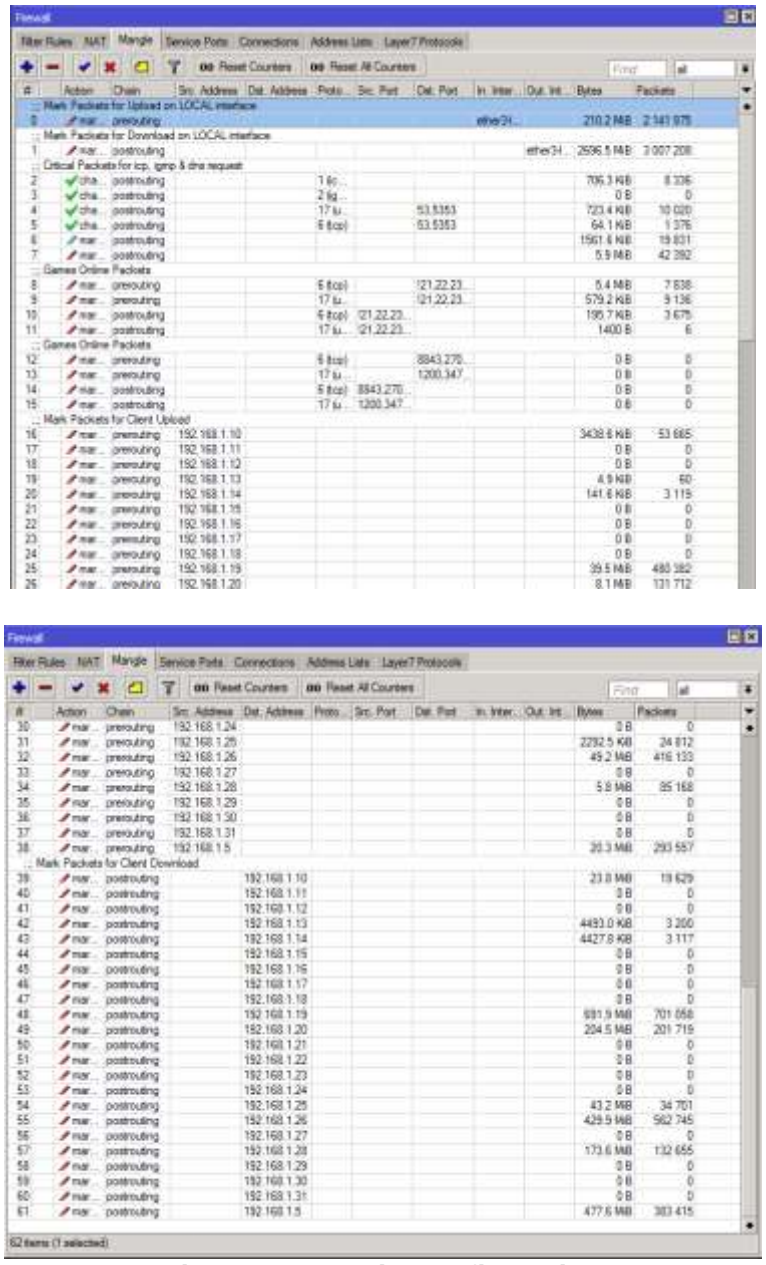

Figure 2. Mangle Configuration

The mangle configuration for upstream and downstream is done the same as client1, client2, client3 and so on until the number of clients is met. Only the given ip address is filled differently. To limit the size of the file to be downloaded so as not to interfere with other network connections then the mangle for each client is given a maximum limit of file size that can be downloaded by 100 Mb, if the file downloaded exceeds the 100 Mb limit then the download speed will accepted each client will get a speed of only 50 kb.

3.3. Queue Type Configuration

Queue Type configuration is provided for upload queue type and queue type download where the type of upload and download is PCQ (Per Connection Queue) which can be used to dynamically share or limit traffic for multi-users according to the settings made. The following configuration images for the queue type upload and download:

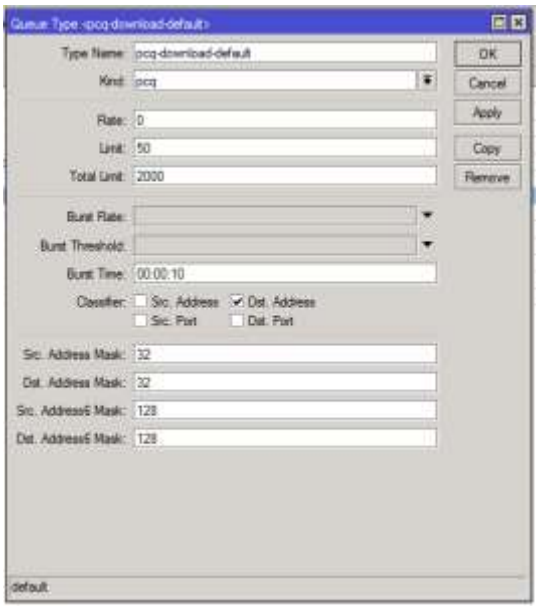

Figure 3. Configuring Queue Type Download

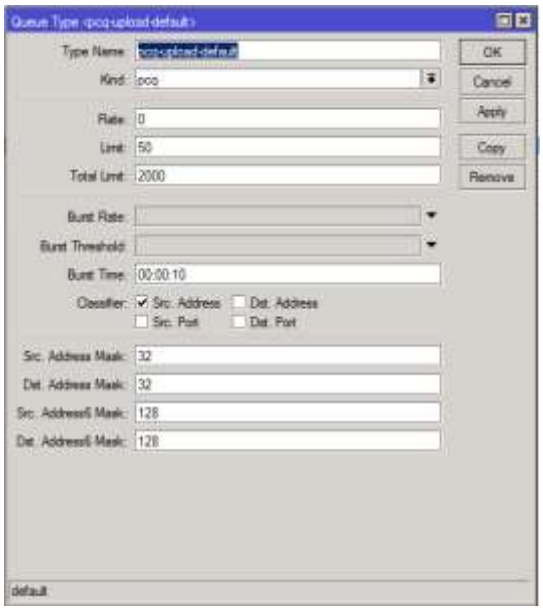

Figure 4. Configuring Queue Type Upload

In the queue type configuration the download rate is 50 kb, so that download files over 100 Mb only get a maximum speed of up to 50 kb.

3.4. Configuring Queue Tree

In the queue tree configuration, it can adjust the amount of bandwidth that will be received by each client. Next the configuration for Download Downloads on client1 as shown below:

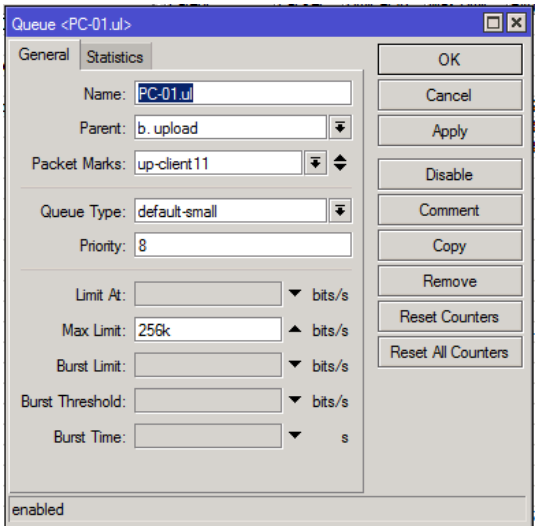

Figure 5. Configuring Queue Tree Upload

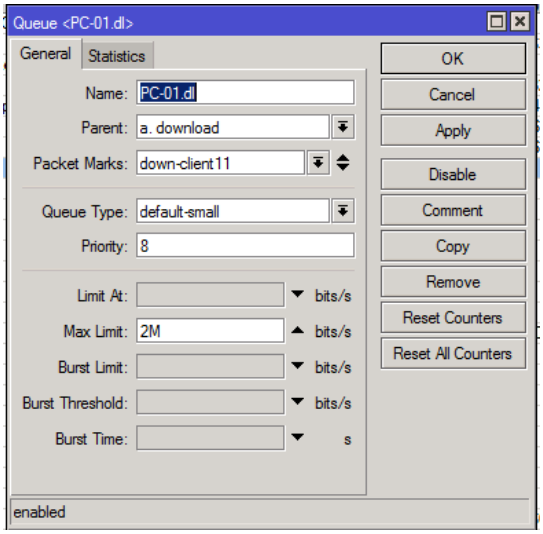

Figure 6. Configuring Queue Tree Download

For configurations on client2, client3 and so on are done the same as small or large bandwidth configurations that will be given to each client.

3.5. Discussion

a) Trial on Client1

The researcher gave client1 a bandwidth of 200 kb for overall uploads and 200 kb for overall downloads. But to limit traffic when congested later, client1 is given an upload for browsing by a maximum of 200 kb. Whereas client1 downloads are given a maximum of 200 KB downloads and a download limit of 100 KB. And the results through the CBN speed test when there are no other clients connecting are as shown below:

Figure 7. Trial Client1 Network Connection

b) Trial on Client2

Researchers also provide clients with Upload and Download for the whole is 200 kb. Whereas when the traffic is congested, client2 is given a 200 kb upload and a maximum of 200 kb download and a limit of 100 kb Then the results through the CBN speed test are as shown below:

Figure 8. Trial Client2 Network Connection

c) Trial on Client3

For client 3 researchers also gave the same bandwidth, namely the Upload and Download for the whole is 200 kb. To download a maximum of 200 KB and a limit of 100 KB. In testing on each client when not connecting together the results of each client does not exceed the overall bandwidth limit that has been set.

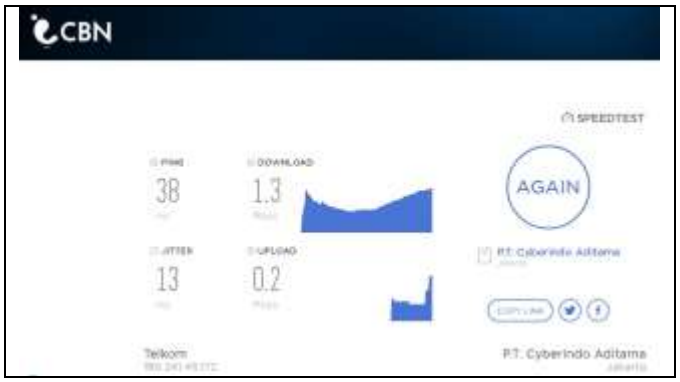

Figure 9. Trial Client2 Network Connection

From the results of trials that have been carried out, it can be concluded that client1, client2, and client3 when tested together. Then the bandwidth received by each client is different but does not exceed the maximum bandwidth limit that has been determined. The results of sharing the bandwidth of the do queue tree can be seen in the following image:

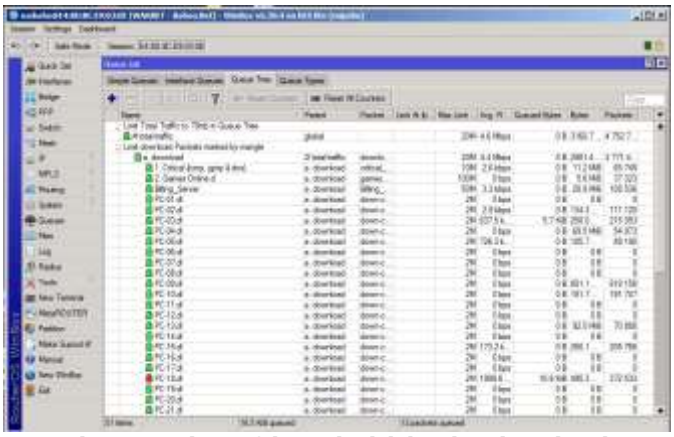

Figure 10. The results of bandwidth sharing in the queue tree

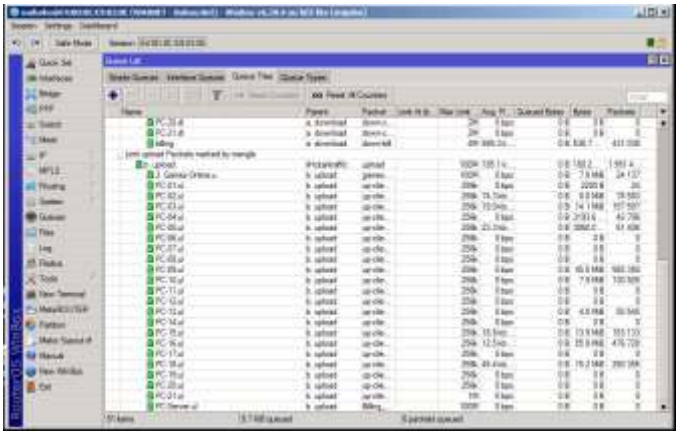

Figure 11. The results of bandwidth sharing in the queue tree

The color description in the picture is as follows:
1. Green is normal traffic below the maximum limit.
2. Yellow is the bandwidth of the traffic approaching the maximum limit.
3. The red color is the traffic bandwidth exceeds the maximum limit.

So when one client does not connect to the internet, bandwidth is automatically given to the client who is connecting to the internet. In the test results in the picture above, client1 shows that it does not connect to the internet because it is in normal traffic and there is no excessive rate. Whereas client3 and client5 share bandwidth with each other and are shown when the rates are mutual through data traffic. From the results of trials and results that have been implemented by researchers, it can be concluded that the microtic network system that has been designed using the queue tree method for stable internet connection in the Game Center BAHONET2 Siantar runs as expected and can be implemented so that lagging occurs when the user is playing the game and other users are uploading or downloading.

4. Conclusion

Several conclusions can be drawn from the research carried out including:

a) The design of a diskless network alias computer without a hard drive is more practical than the old network design found in the BAHONET2 Siantar Game Center.
b) The process of monitoring diskless network design using the Cyberindo program shows that the performance of the server computer is very influential on the client computer, each client has a different data transfer rate, but the size of data received by the client computer is relatively the same, including the client's performance when running games that have been being installed is very influential on the hardware installed on the client itself.
c) The total cost of designing a diskless network using the Cyberindo program is cheaper, because the client computer used in the implementation does not use a hard drive and can use a computer with low specifications.
d) Using the diskless method can reduce the use of local hard disks and make computer performance at the BAHONET2 Siantar Game Center more optimal.
e) The use of a diskless network system is proven to work well so that the client computer can be operated as there is a local hard disk.

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