# Bandwidth Management Design Using the Simple Queue Method in Mikrotik RouterOS and The Winbox Application

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**ABSTRACT**

The function of bandwidth is to manage network bandwidth so that each network user can get the same bandwidth even though there are many users on the network. The use of the internet and computer networks is needed to support company operations. bandwidth requirements used are not small. In many companies, they have to get an internet connection for their individual needs and because the internet speed is only 10 Mbps, if it is not used according to the needs of the job, it will interfere with other workers who want to use the internet at PT. Five Main Techniques. To realize good bandwidth management, therefore the author will make bandwidth management with the simple queue method so that PT. Panca Teknik Utama has a network that can be used stably and according to the needs of each user even though many are using the internet simultaneously. To be able to make bandwidth management the author uses the observation method, interview method, and literature study method to collect data and supporting devices for making this bandwidth management are Mikrotik RouterOS and the Winbox application.

**Keywords:** Bandwidth; Winbox; User

## INTRODUCTION

The development of advances in technology and computer networks that can connect users all over the world are more widely known today as International Networking, abbreviated as the Internet. The use of the internet and computer networks is needed to support company operations. Because the bandwidth requirements used are very large, therefore many users must get an internet

connection for their respective performance needs. Then made bandwidth management using the simple queue method.

The internet is one of the most important needs, both those that can be used for free (free) to those that are paid. To support more efficient study and work activities, therefore, every school or company must have internet facilities. To get good and structured internet facilities, you must have good facilities and tools. One of them that we will discuss is the MikroTik Router OS, which is a router operating system that is currently widely used by internet cafes, offices, and other agencies. MikroTik RouterOS is a reliable network router, equipped with various features and tools, both for wired and wireless networks.

According to (Pamungkas, 2016) Bandwidth management is an important matter in a computer network. The bandwidth management function is to manage network bandwidth so that each network user can get the same bandwidth even though there are many network users. According to (Susianto, 2016) Sharing bandwidth or "Managing Bandwidth Using Queue Tree on Mikrotik Routers" for each host/user is an important part to do for internet service providers. Bandwidth is the most important part of serving internet services, therefore bandwidth must be regulated or managed properly to maximize internet connection. Management bandwidth is to divide the amount of bandwidth needed.

## LITERATURE REVIEW

### Bandwidth

Computer networks consist of computers, software, and other network devices that form a system that has the same goal and works together for that purpose. (Haqqi & Badrul, 2016). Bandwidth is a quantity that shows how much data can be passed in a connection through a network. This term originates from the field of electrical engineering, where bandwidth indicates the total distance or range between the highest and lowest signals on a communication channel (band). Many lay people sometimes equate the meaning of the terms Bandwidth and Data Transfer, which are commonly used on the internet, especially in web hosting packages. Bandwidth itself shows the volume of data that can be transferred per unit of time. While Data Transfer is a measure of data traffic from a website. It's easier to say that bandwidth is the rate of data transfer.

Bandwidth management is a network management technique to provide fair and satisfactory network performance. Bandwidth management is also used to ensure sufficient bandwidth to meet data and information traffic needs and prevent competition between applications. Bandwidth management is an absolute thing for multi-service networks, the more and more varied applications that can be served by a network will affect the use of links in the network. Existing links must be capable to handle the user needs of the application even in a state of congestion though.

Simple Queue is a method of bandwidth management that is easy to configure, where the distribution of bandwidth is set permanently so that regardless of the number of users online, the bandwidth remains constant and tends to decrease. Simple Queue Is the easiest way to perform bandwidth management that is applied to small-scale networks to medium to manage the usage of upload and download bandwidth for each user. (Akbar, RA and Indrajit, RE, 2016). The process on Simple Queue is as follows:

1. All packets will be sorted first so they must pass through every queue before the packet reaches the destination computer, in the queue tree all packets pass through traffic simultaneously without having to be sorted first, therefore a simple queue results in a longer delay.

2. Regulate the bidirectional flow of data packets (both directions) both download and upload

**Mikrotik**

Mikrotik on standard hardware based on Personal Computer (PC) is known for its stability, quality control, and flexibility for various types of data packets and routing process handling. Mikrotik which is made as a computer-based router is very useful for an Internet Service Provider (ISP) who wants to run several applications ranging from the lightest to the most advanced. In addition to routing, Mikrotik can be used for access capacity management (bandwidth, firewall, wireless access point (WiFi), backhaul links, hotspot systems, virtual private network servers, and many others. (RiadiI, 2011). Mikrotik is not free software if you want to take full advantage of it.

According to Winarno Sugeng (2017: 43), A router is a tool that can process data packets on different networks (between networks) with a method that is often called routing. According to Winarno Sugeng (2017: 43), A router is a tool that can process data packets on different networks (between networks) with a method that is often called routing. The router provides data following the IP address of the recipient and sender of the data. The process of providing data is also called Routing. The ARP table is a table that contains information on the physical address (MAC) of the IP address that is also owned by the router. And the router also has a table that contains information about the routes/destination of a network and the path/gateway that must be passed to arrive at the network which is usually called the Routing Table.
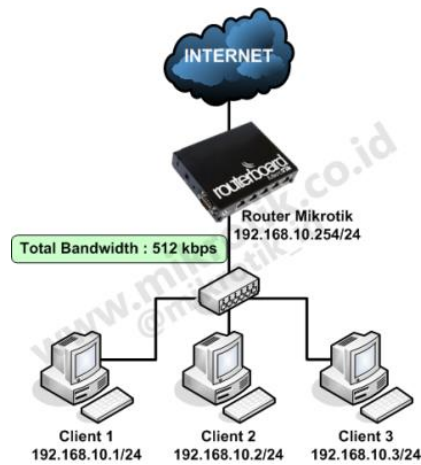
*Figure 1.*
*Bandwidth Management with Simple Queue Method*

Winbox is a utility or software that is used to remotely a proxy server into Graphical User Interface (GUI) mode via the Windows operating system. (Pamungkas, 2016). Confirming Mikrotik via Winbox is more widely used because besides being easy to use, you don't have to memorize console commands. To get Winbox, you can download it from a site or also get it directly on your proxy.
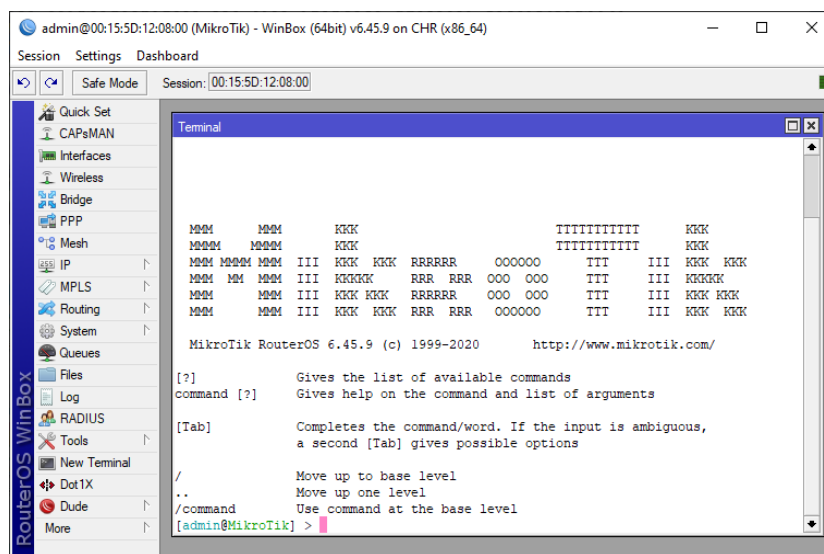


*Figure 2. Winbox*

**METHOD**

The method used for bandwidth management problems for connected PCs, uses a simple queue to divide bandwidth so that each PC has a limit that is adjusted to the needs so that internet usage is more stable. Application of the simple queue method in Mikrotik is used as the main equipment in the research process.

**RESULT AND DISCUSSION**

The result of this research can be seen as follows:
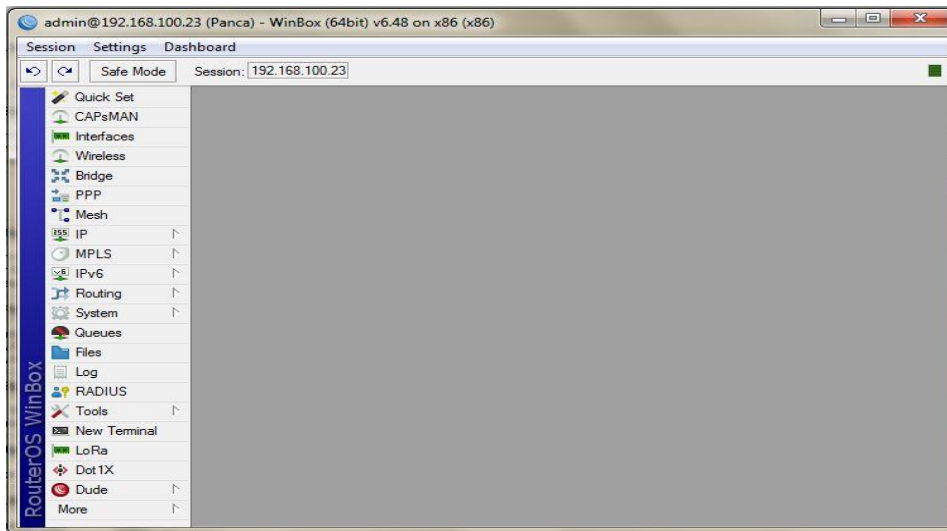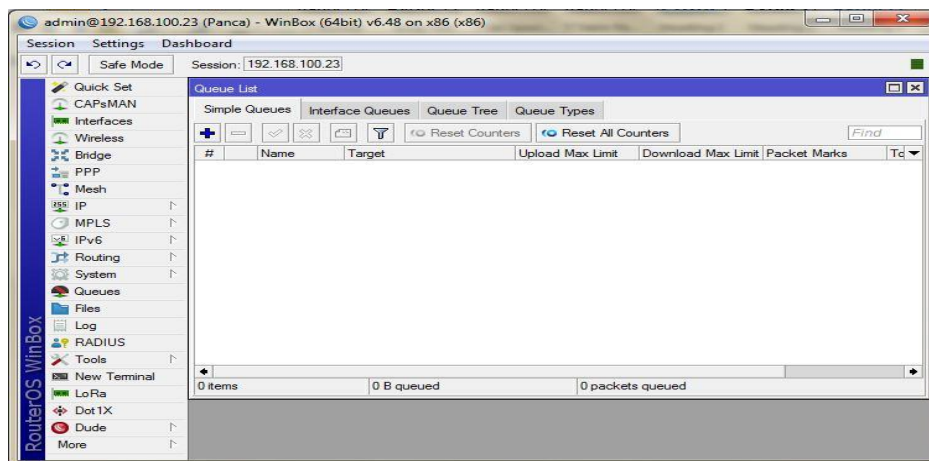1. The first step is to open the Winbox application and select the queues menu



*Figure 3. Winbox Menu*

2. After selecting the queues menu, then enter the simple queue tab.



*Figure 4*
*Menu Simple Queue*

3. Next, to set the bandwidth, the author enters the destination address, which can be one address or several direct addresses, and then enters the upload and download limitations as needed.
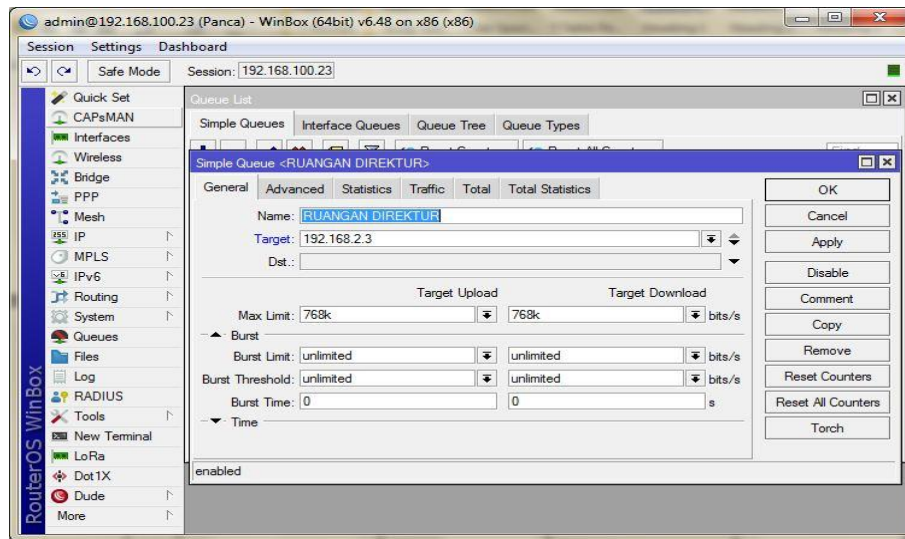
*Figure 5*
*Simple Queue Configuration*

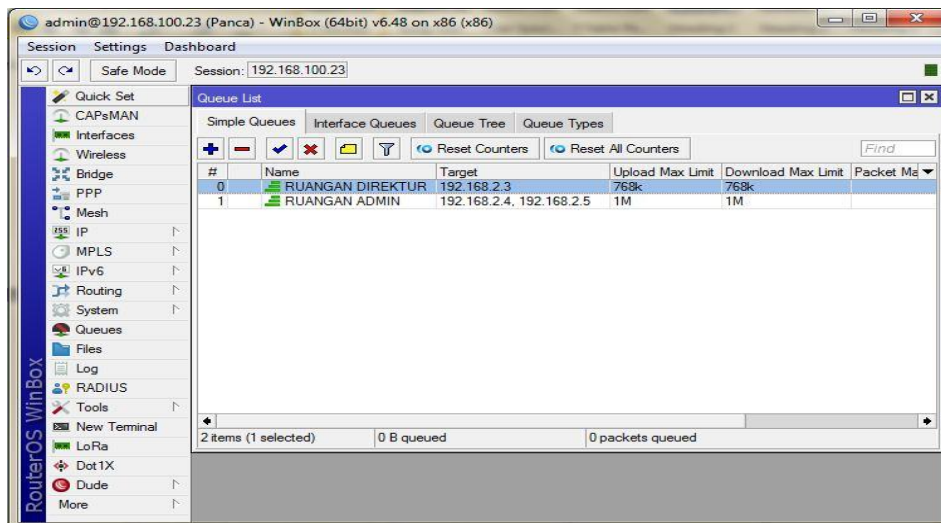4. Insert the address and bandwidth limitation using the simple queue.



*Figure 6.Managed List*

**CONCLUSION**

The conclusion of this research is as follows:

1. Adding a proxy device to share bandwidth between each PC makes the network more stable.

2. No more large bandwidth usage for just one user.

3. With bandwidth management, all PCs get a portion of the internet according to their individual needs.

4. Make it easy to monitor internet access on each PC because bandwidth management has been carried out.

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