Jurnal Sains Informatika Terapan (JSIT)
E-ISSN: 2828-1659, Volume: 2, Issue: 3, Month: October, Year: 2023
Page: 85 - 89, Available online at: https://rcf-indonesia.org/home/

DEVELOPMENT OF MICROTIC ROUTER BANDWIDTH MANAGEMENT APPLICATION AT PLN OFFICE MUARA LABUH

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Article Info

Article history:

Received: August 10, 2023
Revised: September 5, 2023
Accepted: September 30, 2023
Published: October 06, 2023

Keywords:

Network Automation
Bandwidth
Mikrotik
Python

ABSTRACT

Bandwidth instability is a serious problem where the need for using the internet is in the process, it is necessary to manage bandwidth so that bandwidth is properly organized but changes that will be made to bandwidth management require experts in Mikrotik routers, so an application is needed to manage this bandwidth and can be used by ordinary people so that errors in configuration will be avoided because the configuration is done automatically as desired and can certainly help bandwidth management at a lower cost. Making this application by using data collection methods by taking data at PLN Muara Labuh area, interviewing field supervisors, studying literature that supports problem solving and Unified Modeling Language (UML) for software designers along with software testing. The application is built using django.

1. INTRODUCTION

The need for internet in office matters is no longer a side need, but there is also a main need in doing work. At the PLN office, Muara Labuh area, there are also a lot of jobs that use the internet in the process [1]–[3]. Of course this requires internet stability which can be achieved with an even or appropriate bandwidth.

In the research conducted by Aan Restu Mukti(2019) the results of the distribution of the Mikrotik bandwidth can make the access point not exceed the maximum bandwidth limit or limit at 512 kbps in the Mikrotik router. it can be ascertained that Mikrotik is effective in limiting bandwidth and distribution [4]–[6].

To overcome these obstacles, bandwidth management is made that can regulate bandwidth so that it remains stable and also on target in its distribution. based on the conclusions of research conducted by Taufiqur Rohman, the queue tree method on mikrotik can optimize bandwidth, limit bandwidth, manage users, and get low latency or ping [7]–[10]. then the bandwidth management application will be effective if it uses a queue tree.

The use of bandwidth management applications will use libraries in the python programming language to communicate with mikrotik routers and configure bandwidth where the libraries are routeros api and paramiko [11]–[13]. This application is web-based to make it easier to use and the router will be efficient in remote applications on the server and the user will only access it in the browser.

Rheza Adhyatmaka Wiryawan in a journal entitled "Development of Website-Based Network Administration Automation Applications Using Python Programming Language" applies the paramiko library where paramiko is a python library that supports ssh2 [14]–[17]. it does some kind of routing and also web-based vlan configuration using django.

This research aims to overcome the problems of difficult and failed bandwidth configurations by PLN employees of Muara Labuh rayon who are unfamiliar with computer networks.

2. MATERIALS AND METHODS

The research flow begins with a literature study from several books and journals. The application development method uses the RAD development method or Rapid Application Development, which this method has four stages in this RAD method,

namely requirements planning, design, development/prototype and implementation.

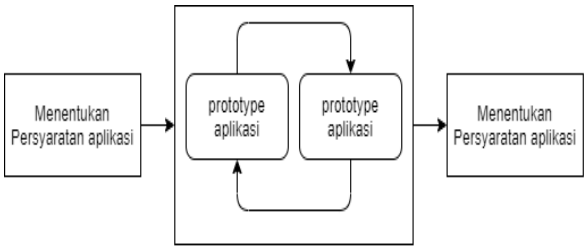

Figure 1. RAD Model Phase

At the requirement identification stage, application development needs require software and hardware, which software requirements are python 3.8 for the programming language, virtualbox for servers and routers on virtual networks [18]–[20]. as well as the hardware used by the laptop powered by a dual core four-tread processor and 8GB of RAM so that it can run virtual machines properly in its use the ubuntu server os used to run applications have installed supporting applications such as docker for deployment and in the docker container python will be installed and supporting libraries such as paramiko, routeros api and other supporting libraries at this stage of research and design a network topology that is useful for map and better understand the network that will be built in the network office [21]–[23].

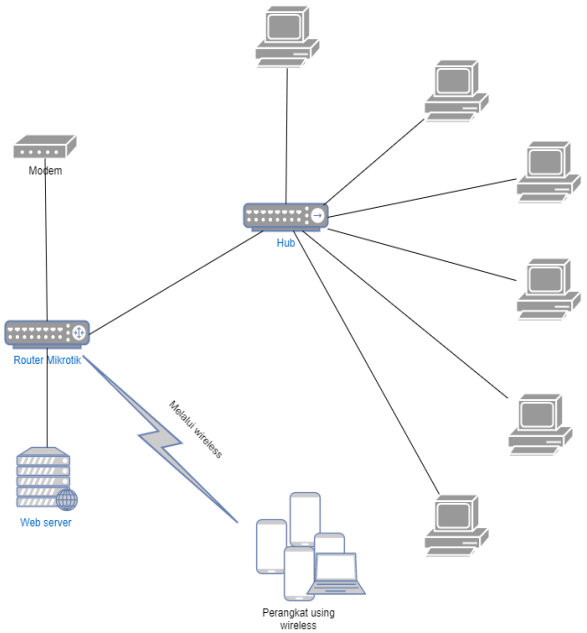

Figure 2. Application Network Topology

At this stage of system design also uses UML diagram modeling. In this study using a use case. Activity use case diagrams are useful for presenting user and system interactions and visualizing functions.

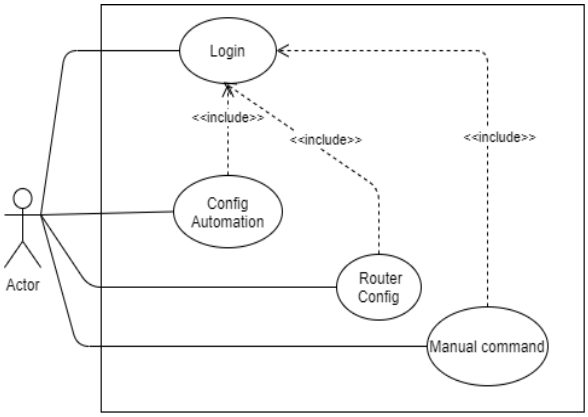

Figure 3. Use case diagrams

Use can visualize user and system interactions that are seen in the use case, users can manage routers, manage automation and also send commands. Activity diagram contains the work flow of the system to be worked on. and aims to clarify the overall process and show the application business process.

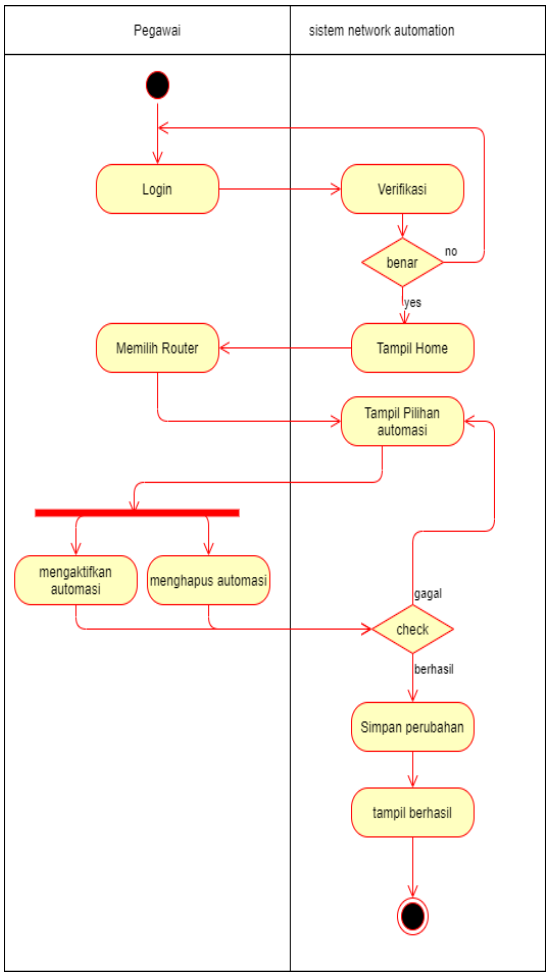

Figure 4. bandwidth Automation activity

In this automation feature activity, the user can activate and deactivate the automation options and also set the configuration depending on the automation used.

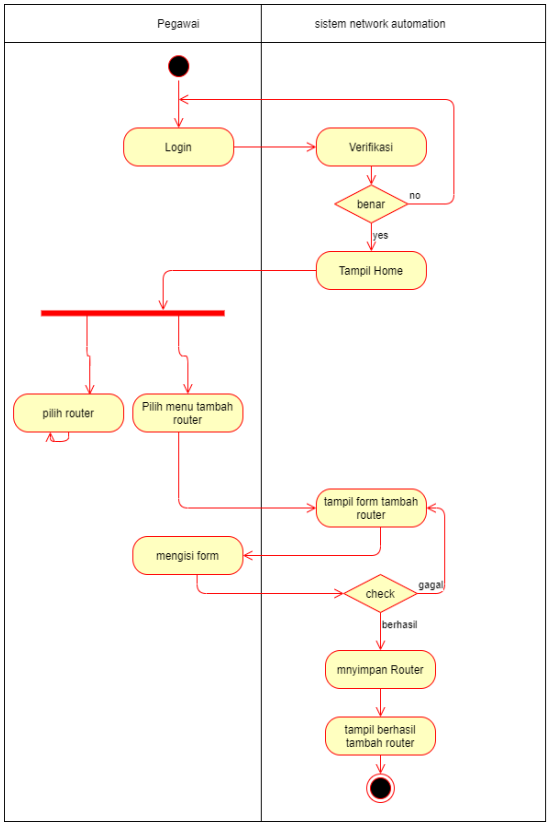

Figure 5. Router Activity

A router feature activity where users can add router and router properties and modify and delete them. However, this activity is not recommended for ordinary users such as bandwidth automation activities.

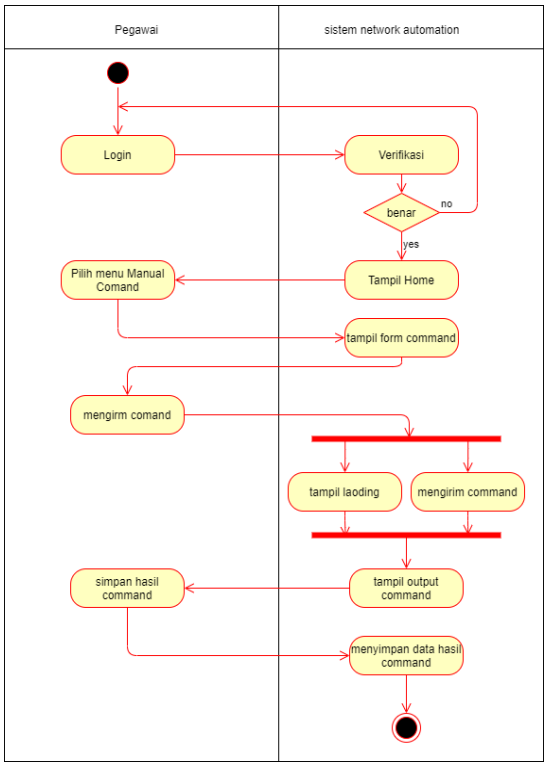

Figure 6. Manual Command Activity

The manual command is indeed part of the user activity but here it is not recommended to configure bandwidth because it can conflict with other automation bandwidth configurations and is recommended for simple configuration and monitoring only.

3. RESULTS AND DISCUSSION

The application has a user interface that can be used by users who are not very familiar with the network. Opened applications require login first to access from all applications.

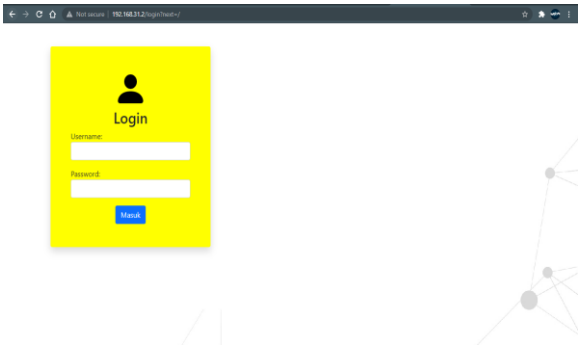

Figure 7. Login view

The application display is in the form of a dashboard where on the left there is a navigation menu and the content section on the right with a ratio of approximately one to six for the width of the menu.

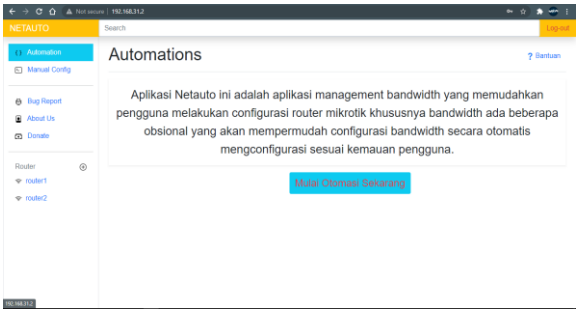

Figure 8. Home view

To perform automation, you can click start automation now or by selecting the router in the side menu, an automation option will appear.

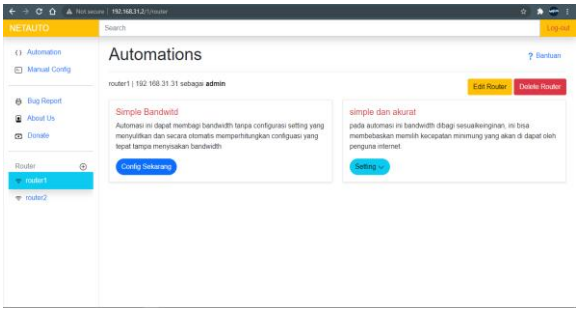

Figure 9. Automation View

In the automation option, there are two existing methods or two options for automation, the first is simple queue pcq which does not need to set a limit at while the second requires a limit at. according to the object of research on users, about 25 devices will be divided so that each user gets a minimum of 3mbps for each user.

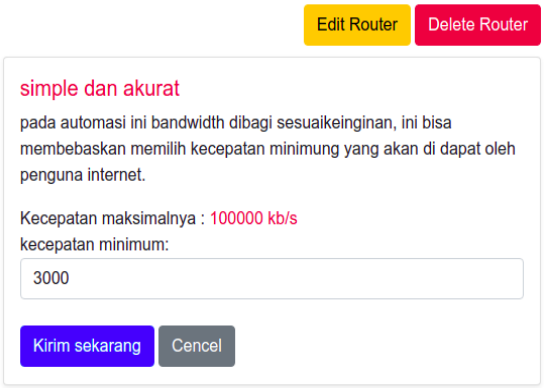

Figure 10. Limit at view

The application of the network to the object of research then obtained measurements using winbox on the configuration on the mikrotik router.

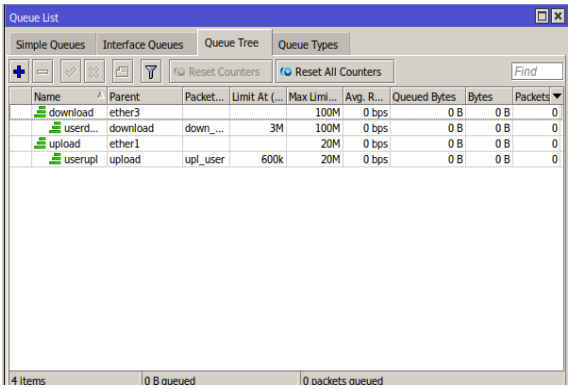

Figure 11. Winbox check

Checking can also be done without the need to use Winbox. You can also use the manual command feature in the application, where there are instructions for each command

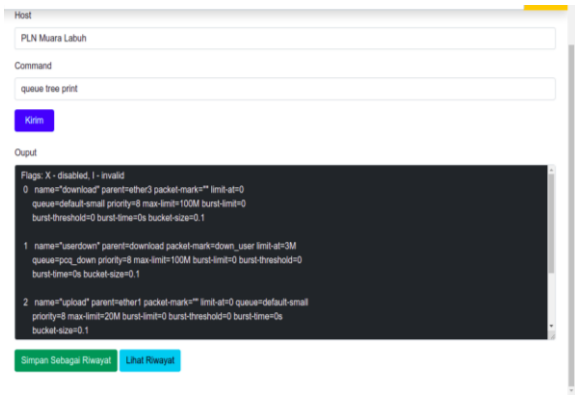

Figure 12.Manual Command view

4. CONCLUSION

Based on the data obtained and the analysis carried out, conclusions can be obtained: Applications made in python and using the paramiko library and router os api can remotely on the mikrotik router. Bandwidth management applications can reduce user errors when setting bandwidth because the configuration is set automatically. Bandwidth management applications can help users who are new to the network because of their simple and minimal complexity.

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