Development Of Paessler Router Traffic Grapher Network Monitoring Application

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ABSTRACT

This study aims to (1) Develop a network monitoring Application as part of the Needs of PT Media Jaya Network Indonesia, (2) Develop a network monitoring Application that has the function of monitoring network traffic, and the condition of existing network devices. This study uses a qualitative research method in the form of development. The primary and secondary data collection in this study was done by PT employees. Media Jaya Network Indonesia, customer data, and network monitoring data at PT. Media Jaya Network Indonesia. The results obtained from this study are (1) Development of network monitoring using the PRTG application can help monitor and manage network performance effectively and efficiently and ensure more optimal service quality to customers. (2) The results of monitoring carried out at PT. Media Jaya Network Indonesia using the PRTG application obtained monitoring data using the Black Box Testing method. Black box testing focuses on testing software functionality so that the application can run properly and identify errors in the system that has been created. The results of the monitoring test are declared valid as a whole, by displaying the dashboard page, displaying up/down devices, displaying network graphs in real-time, and displaying network monitoring results reports.

Keywords: Monitoring, PRTG, Black Box Testing

1. INTRODUCTION

Technology has experienced quite significant developments to date. The flow of globalization that continues to run and develop impacts human life. Now human needs are never separated from the internet. The internet is a network of computers that are interconnected to form a large network that forms a network system that can cover the entire world which is commonly called a global computer network. This network can connect fellow humans with telecommunications lines via telephone, radio, satellite, and others. The internet functions to help humans in everyday life. Currently, almost everyone can operate the internet, from young to old without limits. The function of the internet which was created only for the personal interests of a country, has now spread to all corners of the world, so that many functions of the internet cannot be classified in detail. Human needs are getting easier with the internet available today. The internet is used as a medium of communication and exchanging information with each other (Gani, 2015).

An internet network that has been conceptualized and managed properly by an administrator must of course be monitored regularly, with the intention that the network can run stably without any interference. Technological developments are increasingly rapid due to the high human need to keep the infrastructure running, so supporting devices are needed to monitor activities in each network mode periodically. One of the operating systems that are useful in computer network administration is Mikrotik (Juliono & Rosyani, 2022). Mikrotik is designed as a simple device that has various features that will later be used in managing networks, such as designing networks and building a network system both

on a small and large scale. Based on the network administration data obtained, it can later be used as analysis material whether the network is still suitable for use or its capacity needs to be increased.

In previous research by (Hermawan et al., 2023) entitled "Web-Based Network Monitoring Application at the Communication and Informatics Office of Sragen Regency." This study has a problem in an area, namely the lack of balance between the complexity of existing infrastructure and adequate network monitoring. The results of the study are that the web-based network monitoring information system has 2 access rights, namely admin and technician. The advantages of this system produces a web-based network monitoring information system application that makes it easier for admins to monitor intranet networks and coordinate with the administrator team in the field in mapping network damage in the Sragen Regency area.

In the study (Tenriawaru et al., 2022) entitled "Development of a Computer Network Monitoring System Using Dude". The results of the study are based on the dude application in the Information Technology Unit (UTI) room of the Faculty of Mathematics and Natural Sciences, Halu Oleo University, starting from the initial observation of the study to the testing process stage, it can be concluded that the throughput speed is 62 bits/s and packet loss is 2.1%, with the results of throughput and packet loss measurements according to the typhoon category, including the good category. In addition, it reduces the possibility of errors and makes it easier for officers or operators when a computer's internet connection is down or disconnected.

In the study (Pangestu & Dasmen, 2018) entitled "Monitoring and Analysis of Distribution Network Traffic at PT. Mora Telematika Indonesia Regional Palembang with PRTG". The results of the study are the results of monitoring at PT. Mora Telematika Indonesia Regional Palembang using the PRTG (Paessler router traffic grapher) application, the results are network traffic data, highest traffic, and lowest traffic. In addition, the network monitoring application can detect and provide warnings to network administrators if there is an error in the server or user network infrastructure.

Based on the demands of internet needs today, PT. Media Jaya Network Indonesia is here as a telecommunications sales service to meet human needs for the internet. proven by the results of an interview with one of the owners of PT. Media Jaya Network Indonesia said that:
"This year, people both in cities and villages are still very dependent on the internet around them, this can be proven by the increase in customers up to 100 customers this year, this is also undeniable due to the huge impact of the internet (DF 10-03-2024)".

From the interview results above, it is proven that the need for the internet at this time is very large, because currently the internet is not only used in cities, but in remote villages, the community is also very dependent on the internet. When meeting the increasingly diverse needs of society, of course, PT. Media Jaya Network Indonesia does not always run according to expectations, this is evidenced by network monitoring at PT. Media Jaya Network Indonesia is still relatively slow, with this obstacle certainly affects the performance of the internet network provided to each customer and also the benefits that will be generated by PT. Media Jaya Network Indonesia, because this will affect customer satisfaction.

Therefore, researchers want to create a network monitoring development with PRTG (Paessler Router Traffic Grapper) application to help monitor and manage network performance effectively with quality of service: Internet Service Provider (ISP) companies that ensure fast problem-finding performance and ensure more optimal service quality to customers. In addition, security and tracking of traffic patterns and signs of cyber attacks or security threats faster.

2. RESEARCH METHOD

This type of research is a development model research. This research model can produce certain products and test the effectiveness of the product. The data collected by the researcher are primary data and secondary data. Primary data is generated from the results of interviews with employees of PT. Media Jaya Network Indonesia and network monitoring observations. While secondary data is obtained from traffic results that have not been developed by researchers and literature reviews. The subjects of the research are employees of PT. Media Jaya Network Indonesia, while the objects of the research are customer data and network monitoring data at PT. Media Jaya Network Indonesia.

The model used is a network system development model, which is carried out after obtaining primary data and secondary data. The first stage flow in this study is to see the results of network traffic and analyze network traffic needs. Data collection at the analysis stage is carried out by interviewing employees, observing network traffic, and also reviewing literature. After conducting the analysis, the

researcher will carry out an action plan to create a development plan. After that, the researcher collects several traffic which is divided into three, namely, traffic up, traffic down, and downtime. The last stage is the testing and evaluation stage so that the shortcomings and advantages of the development results in the application can be identified.

3. RESULT AND DISCUSION
Analysis of the Running System

The network monitoring application currently running at PT. Media Jaya Network Indonesia still uses a Simple Application using The Dude. As for the analysis of the Network Monitoring Application currently running at PT. Media Jaya Network Indonesia. The following is a Use Case Diagram running on the Network Monitoring Application at PT Media Jaya Network Indonesia:
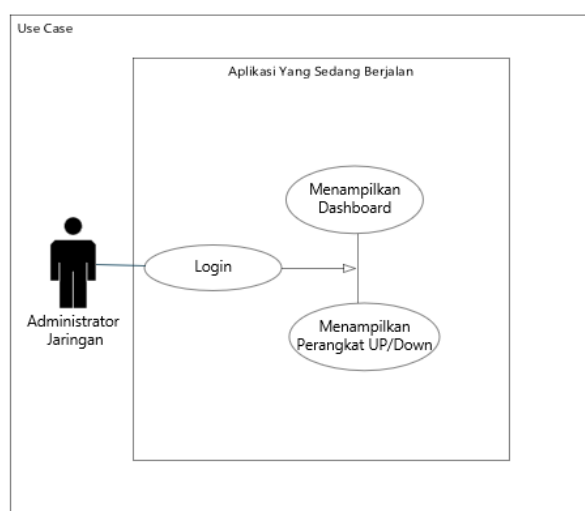
Figure 1. Use Case Diagram Running on the Application

Based on the researcher's observations of the running system and the results of the interviews that have been conducted, there are several problems faced, including:
1. The lack of effectiveness of The Dude Network Monitoring Application at PT Media Jaya Network Indonesia.
2. The menu provided in the current The Dude network monitoring application is still incomplete and seems too simple.
3. There is no report menu in the dude network monitoring application currently running at PT Media Jaya Network Indonesia.

After observing and researching several problems that occur in the running system, the researcher proposed several alternative solutions to the problems faced, including:
1. Development of a network monitoring application using Paessler router traffic grapher.
2. Development of a Paessler router traffic grapher network monitoring application that can facilitate network administration to monitor the network at PT Media Jaya Network Indonesia
3. Development of a network monitoring application that can help maximize the performance and security of the existing network.

Application Development Paessler Router Traffic Grapher (PRTG)

This Network Monitoring Application is created by developing the Paessler Router Traffic Grapher (PRTG) application. Based on its use, this application consists of several main menus, namely the login menu, dashboard menu, up/down monitoring menu, real-time network graph monitoring menu, and network monitoring result report menu.

a. Login Menu

The login menu is the initial or first page when monitoring the internet network. In this menu, you must enter encryption, namely the login name and password that have been set. The following is a display of the login menu.
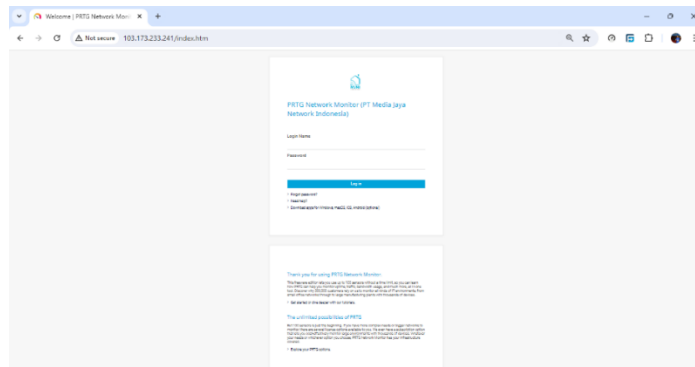
Figure 2. Main menu display of the application

b. Dashboard Menu
In the dashboard menu, a network administrator can see various internet network devices that will be monitored.
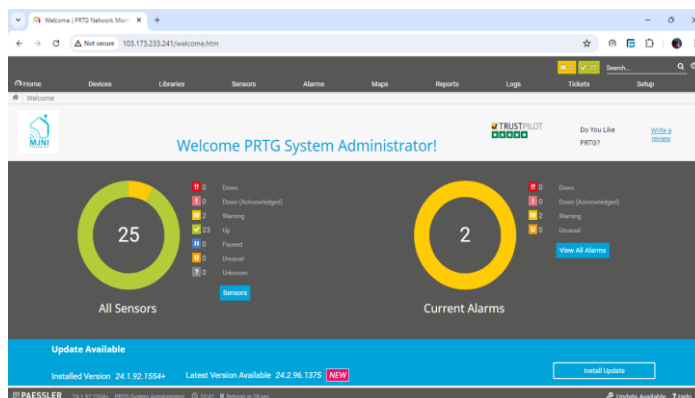

Figure 3. Dashboard Menu View

c. Monitoring Up/Down Menu
The up/down network monitoring menu functions to monitor network connectivity status in real time. Some of the functions in this menu are, identifying whether a network device (such as a server, router, switch) or internet connection is active (up) or inactive (down), providing clear visual information about the operational status of the network device, providing notifications or alarms when a device or network connection experiences downtime.
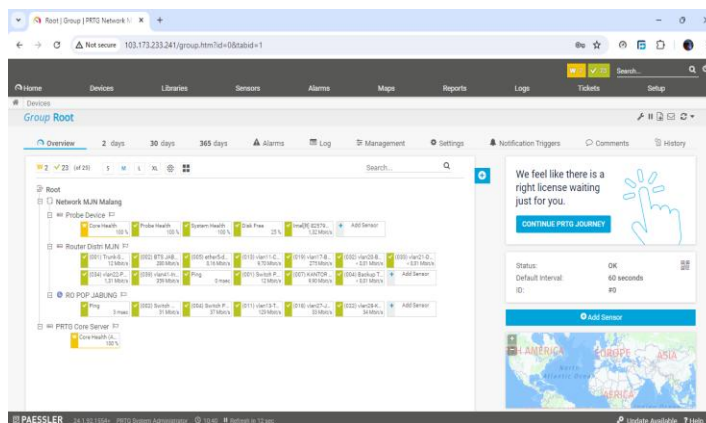
Figure 4. Network Monitoring Menu Display Up/down

d. Real-time Network Graphics Monitoring Menu
    The Real-time Network Graphics Monitoring menu is one of the most important tools in network management because it provides direct information about network performance and health. The main functions of this menu include monitoring bandwidth usage, tracking latency and response time, and assessing network throughput.
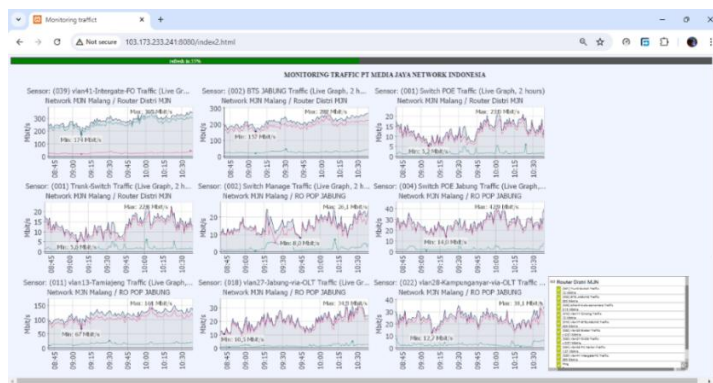
Figure 5. Real-Time Graphic Monitoring Display

e. Network monitoring results report Menu
    In the report menu, network administrators can view overall network performance reports, analyze bandwidth usage, view data usage statistics, compile security reports, identify network problems, perform capacity planning, create custom reports, send monthly reports, present reports in graphical form, and compare performance between networks.
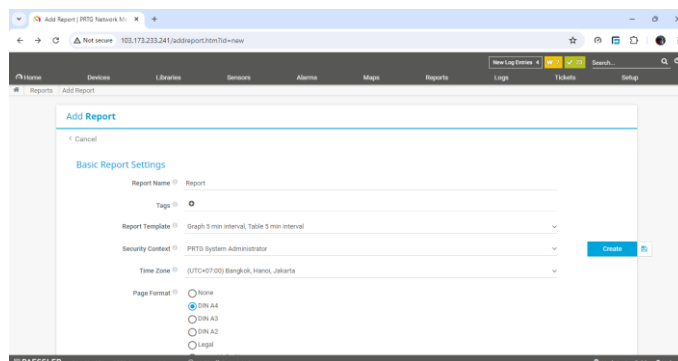
Figure 6. Network Monitoring Results Report Display Menu

Network monitoring at PT. Media Jaya Network Indonesia was conducted for 6 days within 24 hours per day, starting from 00.00-23.59 WIB in the Jabung District area. Some of the customers monitored were the Base Transceiver Station in the Jabung District area. The monitoring results include the highest usage traffic, the lowest usage traffic, and the average per day. The following is a display of the development of traffic results carried out by researchers using the PRTG application:
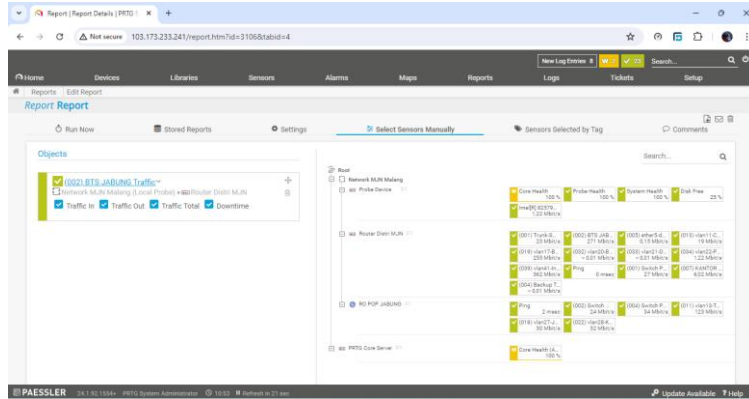
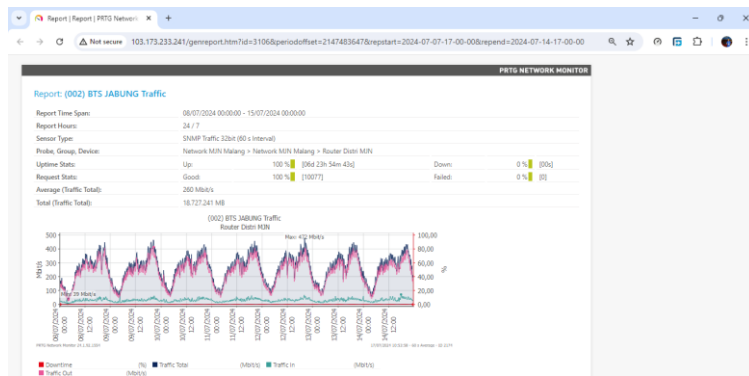Figure 7. Base Transceiver Station area of Jabung District

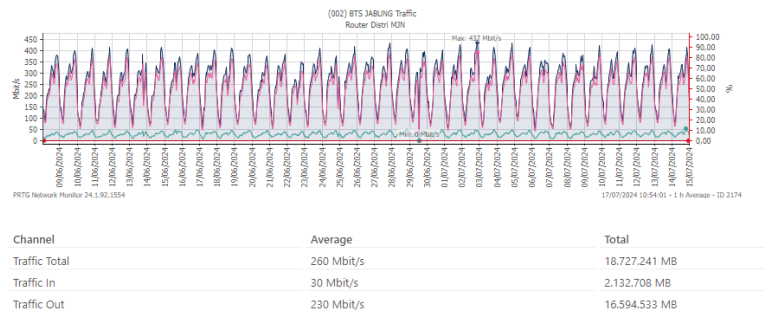Figure 8. Base Transceiver Station Traffic Jabung District

Figure 9. Base Transceiver Station Traffic Jabung District

Figure 10. Total Traffic Area View of Jabung District

Traffic data is an ethernet port on a router device that has been active or used. Traffic is also the result of data acquisition in and out (upload-download) obtained from the network monitoring process. Based on the traffic results obtained in the network monitoring process, can be used to measure analog and digital data flows on the network.

After the network monitoring application is developed, the next step taken by the researcher is to test and evaluate the network monitoring application. In testing this system, the researcher uses the Black box testing method. Testing with the Black box testing method is focused on testing software according to functionality so that the application can work properly and to find out about errors in the system that has been completed. The following is a table of system testing using the Black box testing method:

Test Scenario	Test Details	Expected Results	Test Result
The network administrator accesses the Dashboard	Dashboard Page	Can display the dashboard page of the monitored device	Valid
Network administrator accesses Network Up/Down	Device Page Up/Down	Can display device page up/down	Valid
Network administrators access network traffic in real-time.	Network Traffic Page	Displays network traffic page in real time	Valid
Network administrator accesses Report	Report Page	Displaying the Network Monitoring Results Report page	Valid

Table 1. Black Box Testing System Testing Table

4. CONCLUSIONS

Internet is one of the primary needs used every day. In network management, monitoring is needed to maintain network stability. Researchers use the PRTG application to monitor the network so that it can help monitor and manage network performance effectively and efficiently and ensure optimal service quality to customers. Network monitoring applications are used to collect statistical data, detect networks, and provide warnings to administrators if there is an error in the server or user network infrastructure.

From the monitoring results conducted at PT. Media Jaya Network Indonesia using the PRTG application, the results obtained are in the form of monitoring data using the Black Box Testing method. In the process, Black box testing focuses on testing software functionality so that the application can run properly and identify errors in the system that has been completed. The results of this study display the dashboard page, display up/down devices, display network graphs in real-time, and display network monitoring results reports with valid test results as a whole.

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