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Application of Allot Secure Service Gateway for WAN Network Bandwidth Management at PT. Bank Permata Tbk

Dimas Trisna Putra Pambarep[1], Sussana Dwi Yulianti Kusuma[2],
dimastrisna522@gmail.com1, dosen00682@unpam.ac.id2,
[1] Informatics Study Program, Pamulang University, Banten, Indonesia
[2] Educational Technology Study Program, Pamulang University, Banten, Indonesia

ABSTRACT

As is generally experienced by large companies that have a large number of branches and centralized applications, PT. Bank Permata Tbk currently has WAN Bandwidth that manages links and the complexity of current applications and Protocols. However, the application and observation of the Bandwidth settings has not been maximized. If these problems are not regulated, it is feared that this will interfere with the performance of PT. Bank Permata Tbk which in the end will be able to reduce the level of business competition ability when compared to other Top companies that become its competitors. The research method used in this research is the HTB (Hierarchical Token Bucket) method. The HTB method is a method that functions to regulate the distribution of Bandwidth, the division is carried out in a hierarchy which is divided into classes to make Bandwidth Management easier. At this stage, the problem that will become the research object of the problem formulation is the absence of structured reports for Bandwidth usage in each branch. In the analysis of this system it can be concluded that PT. Bank Permata Tbk does not yet have a structured report for Bandwidth usage at each branch and without any special limitations on Bandwidth. And with this problem, the branch application that is used does not run optimally. With the implementation of Bandwidth Management using the Allot Secure Service Gateway on the WAN network of PT. Bank Permata Tbk so that it can produce structured reports and monitor Traffic Bandwidth from both branches to branch applications.

Keywords: Bandwidth; Hierarchical Token Bucket; WAN;

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Correspondence Author:

Dimas Trisna Putra Pambarep
Informatics Study Program,
Pamulang University,
Jl. Patal II RT 009/003 No. 42, Paku Jaya, North Serpong.
Email: dimastrisna522@gmail.com

1. INTRODUCTION

Bandwidth is the capacity that can be used on internet cables so that they can be passed by data packet traffic to the maximum or how much data packet consumption is in bps (bits per second). A bandwidth has a function to divide the speed of the data transfer process, set the amount of data to be transferred, and as a measure of the medium for data transmission. While Bandwidth Management is a device that can be used to manage and optimize various types of networks by implementing Quality Of Service (QoS) services to determine the types of network traffic.

As is generally experienced by large companies that have a large number of branches and centralized applications, PT. Bank Permata Tbk currently has a WAN Bandwidth setting that regulates Link and the complexity of current applications and protocols.

Problems faced by PT. Bank Permata Tbk has no monitoring to see Total Traffic Bandwidth, both in terms of Traffic Line statistics, Branch Traffic statistics, and Application Traffic statistics. Which causes the absence of structured reports for Bandwidth usage in each branch.

Solutions that can be used to manage bandwidth usage and monitor WAN traffic bandwidth can use Allot Secure Service Gateway. Allot has multiple Ethernet links at speeds up to 8 Gbps and has 16 Interface network ports, and can monitor all real-time traffic usage, policy enforcement, and traffic control. This device can help users to control bandwidth utilization and costs by ensuring quality of experience (QoE) for all network users.

2. RESEARCH METHOD

The research method used in the research is the HTB (Hierarchical Token Bucket) method. The HTB method is a method that functions to manage the division of Bandwidth, the division is carried out hierarchically which is divided into classes so as to facilitate the management of Bandwidth. The HTB method is applied to manage the bandwidth to be distributed to the branch / client, in the application of a method, of course, you must first know how the architecture of the network.

2.1. Analytical Methods / Techniques

Methods / Techniques of analysis in research conducted by the author by using the following data collection methods:

A. Observation
   Observation is a method of data collection carried out to observe and review carefully and directly at the research location to find out the conditions that occur then used to prove the correctness of the research design being carried out.
B. Interview
   The purpose of the interview is to obtain information directly about certain situations and conditions, complete a scientific investigation, and obtain data that affect certain situations or parties.

2.2. Perancangan Unified Modeling Language (UML)

Unified Modeling Language, or UML, is an object-oriented system design language used in simplifying more difficult problems with the aim of making things simpler and easier to understand (Hendini, 2016). The following are four different diagrams that programmers use when developing applications, including:

2.2.1. Use Case Diagrams

Use Case diagrams are depictions of the interactions of components in the application and how they interact with users. Use Case diagrams have actors that describe the users and the activities performed. These actors and activities are linked to describe how interactions can be performed by users in the system created.

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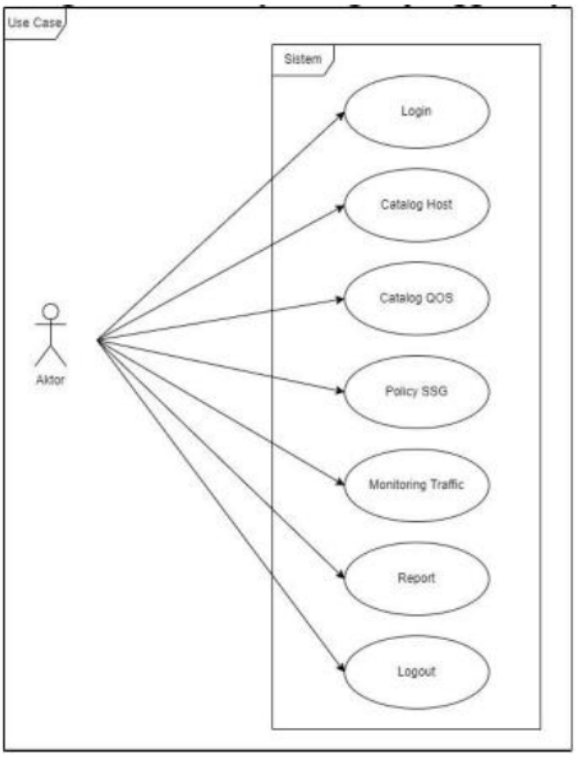

Figure 1. Use Case Diagram

2.2.2. Activity Diagram

Activity Diagram is a picture of how the process of running a system that has been created. This activity diagram is divided into several activities that can be performed by users as follows:

A. Activity Diagram Host

The picture below is the process of creating a Host list that will be created in the Host Catalog.

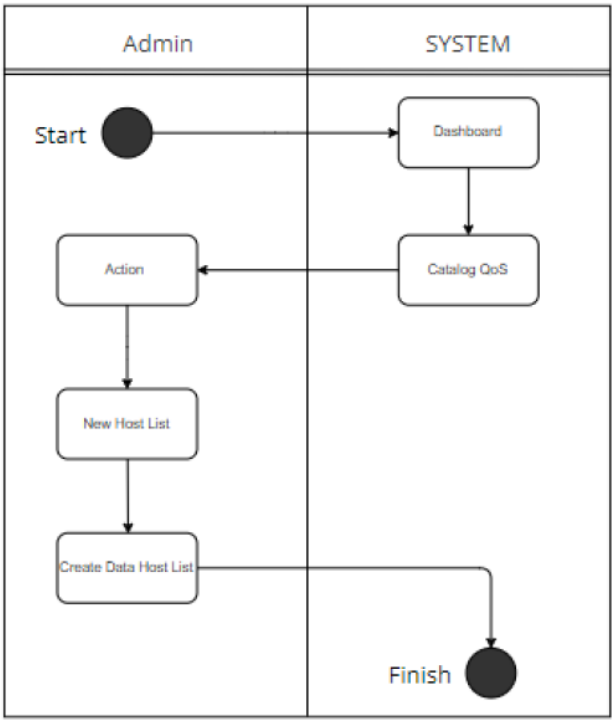

Figure 2. Activity Diagram Host

B. Activity Diagram QoS Line

The picture below explains the process of making QoS Line in the QoS Catalog menu.

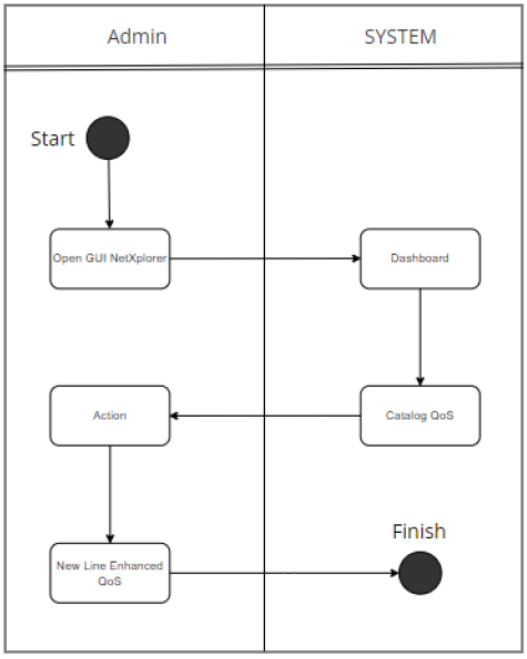

Figure 3. Activity Diagram QoS Line

C. Activity Diagram QoS Pipe

The picture below explains the process of making QoS Pipe in the QoS Catalog menu.

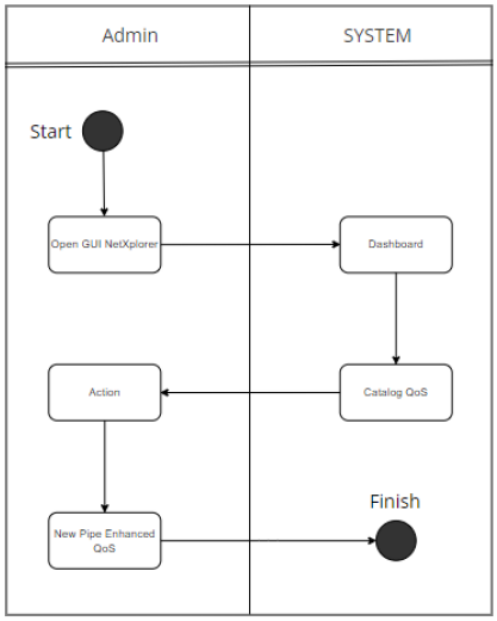

Figure 4. Activity Diagram QoS Pipe

D. Activity Diagram QoS Virtual Channel

The picture below explains the process of making a QoS Line created in the QoS Catalog menu.

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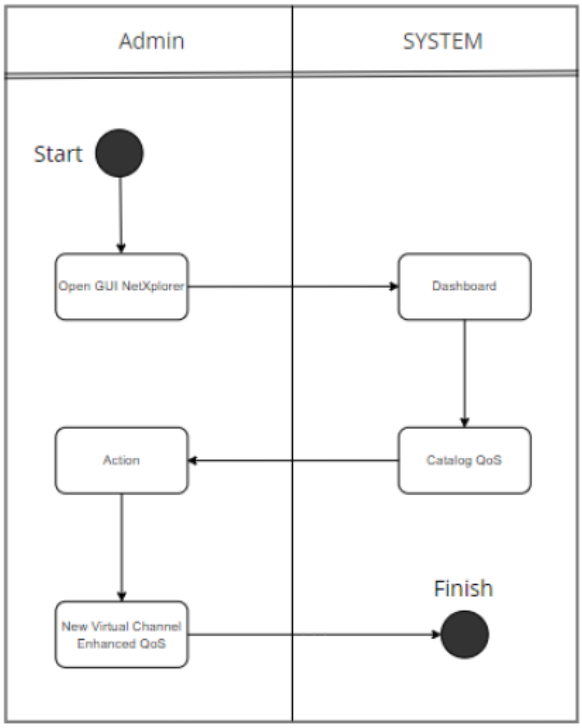

Figure 5. Activity Diagram QoS Virtual Channel

E. Activity Diagram Policy

The picture below explains how the process of running the monitoring rules Policy created in the NetXplorer dashboard.

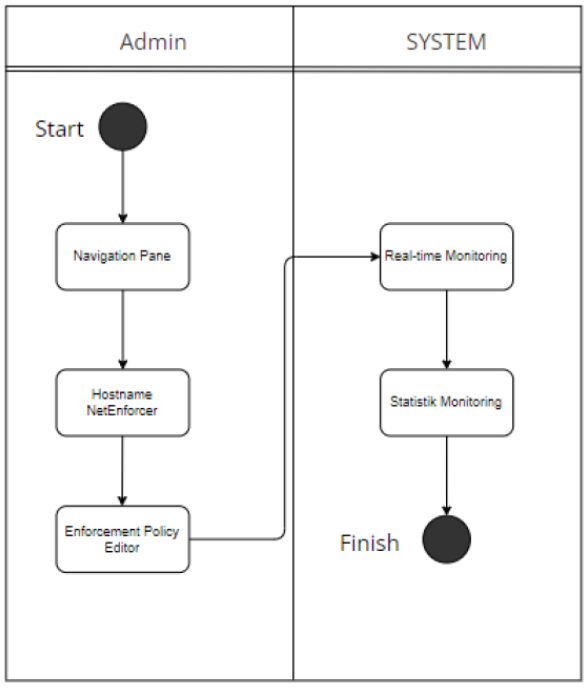

Figure 6. Activity Diagram Policy

2.3. System Design

This device uses an information system based on the results of observation and analysis of needs. And assisted by a scalable management system devoted to Allot, namely NetXplorer.

2.3.1. Network Topology

Network topology is how a computer and other technological devices are connected to each other.

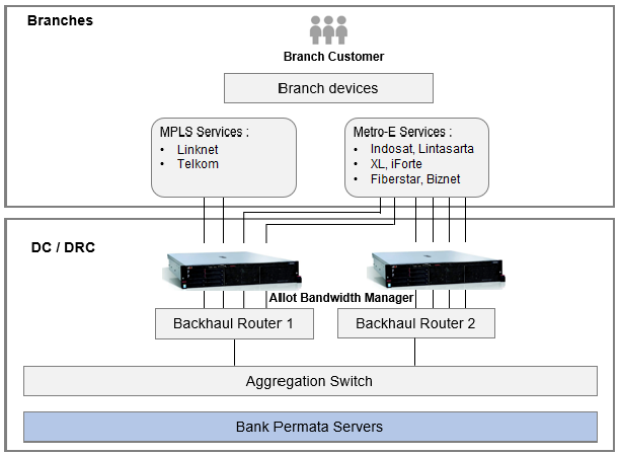

Figure 7. Network Topology

2.3.2. Allot Connection Topology

The picture below is a connection topology of two Allots and four Bypasses at the DRC location that allows Allot to connect to several internet network connection sessions used.

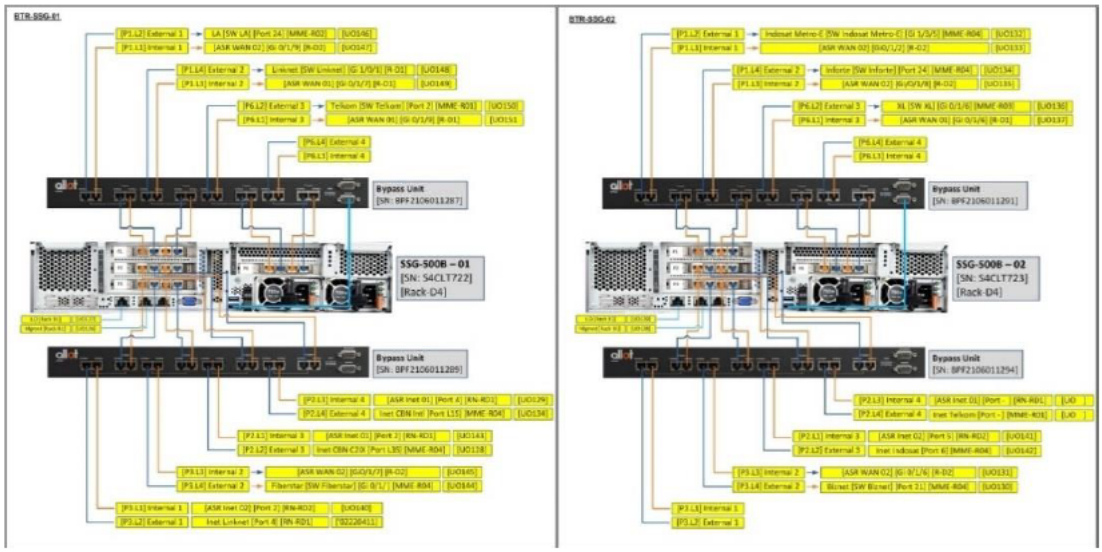

Figure 8. DRC Network Topology

3. RESULTS AND DISCUSSION

The result of this study is the implementation of Bandwidth management using Allot Secure Service Gateway in the WAN network of PT. Bank Permata Tbk so that it can produce structured reports and monitor Traffic Bandwidth both branches to branch applications.

3.1 Graph Testing Before QoS Implementation

The picture below is a display of branch policies that have not been implemented QoS and are still in the status of Normal Pipe QoS and Normal Virtual Channel QoS.

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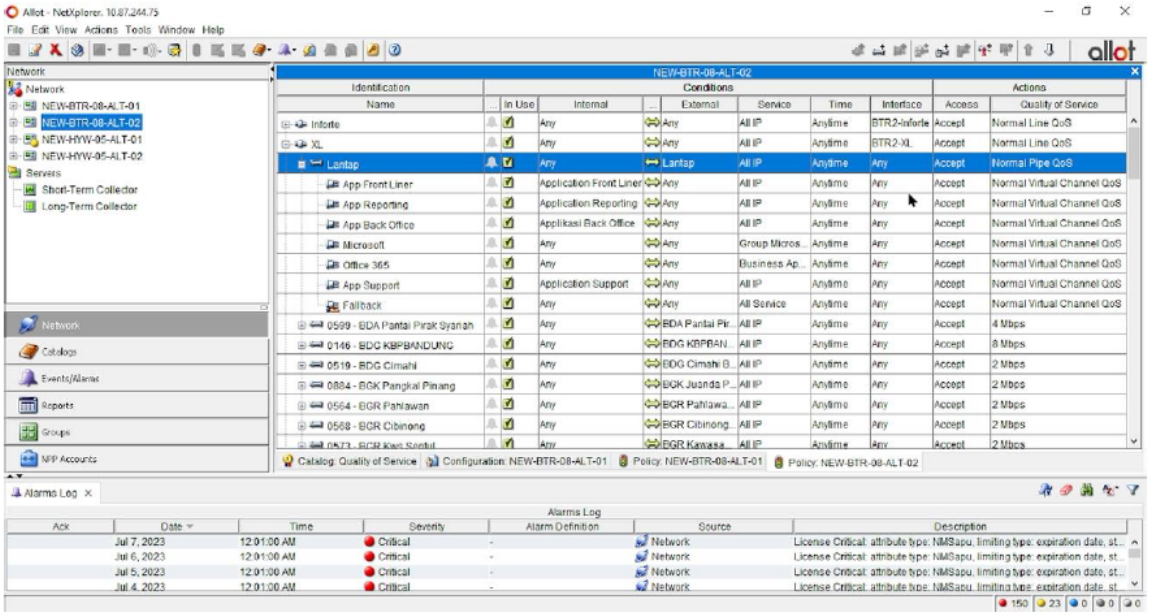

Figure 9. Lantap Branch Policy

The picture below is a monitoging graph of Bandwidth usage statistics from Lantap branches where there is still no QoS application for Bandwidth throttling.

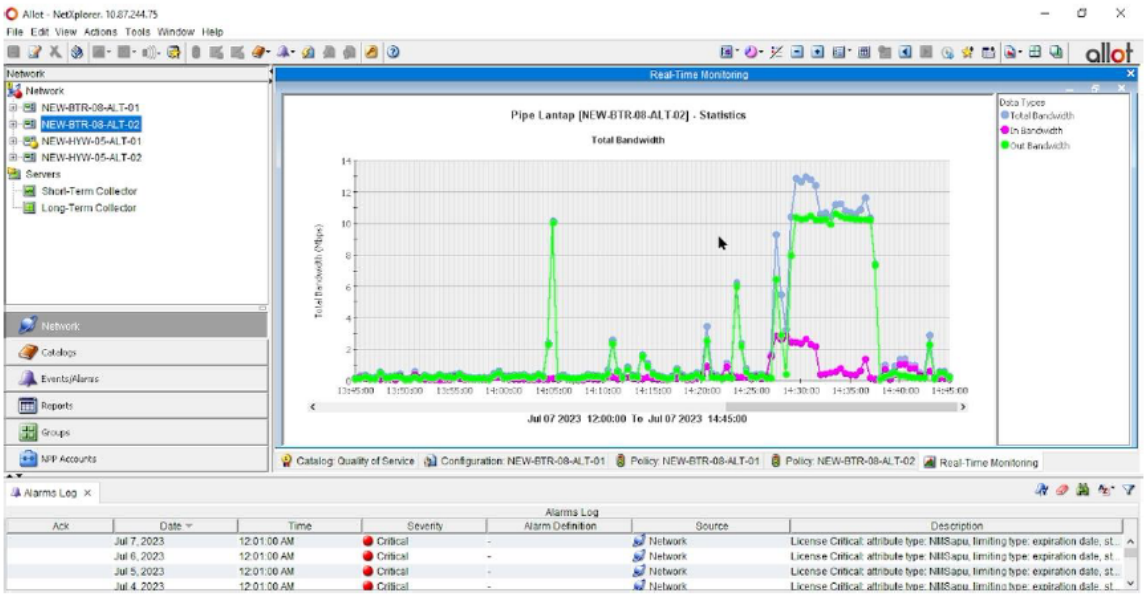

Figure 10. Lantap Branch Statistics Testing

The figure below is a graph of the top application usage from the Lantap branch where there is still no QoS implementation for application bandwidth throttling.

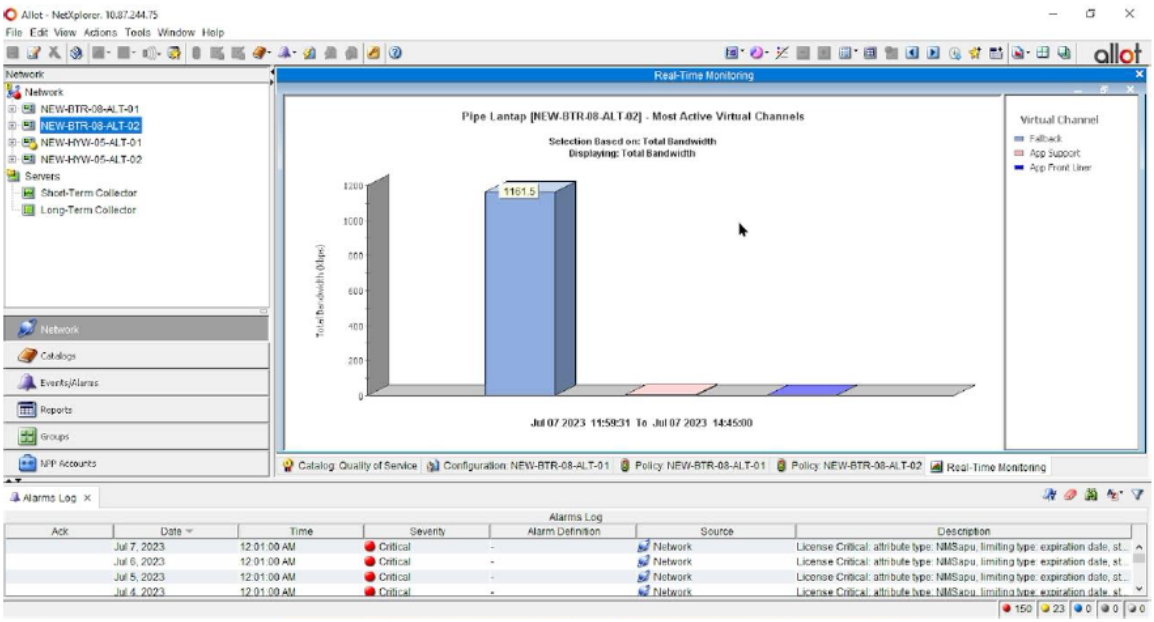

Figure 11. Lantap Branch VC Testing

The picture below is a graph of the monitoring protocol used in the Lantap branch. And see what applications have not been defined so that they are in fallback state. See Figure 11.

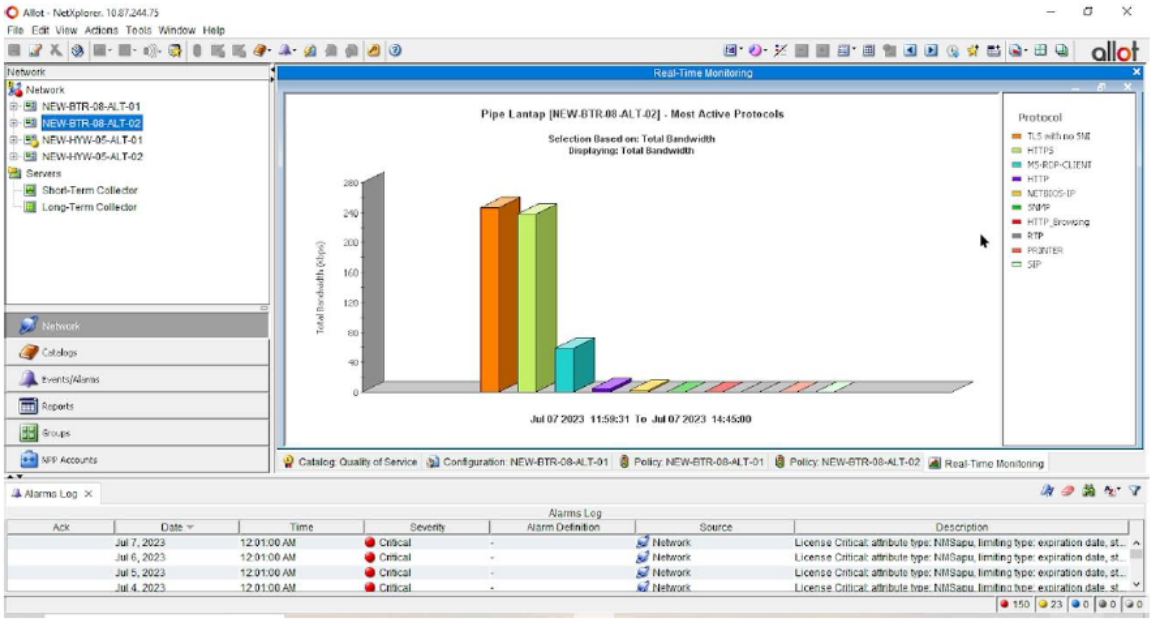

Figure 12. Testing Protocols Lantap Branch

3.2. Chart Testing After QoS Implementation.

The picture below is a display of the Policy that has been carried out in the implementation of QoS, both from the QoS side of the QoS Branch to the QoS application

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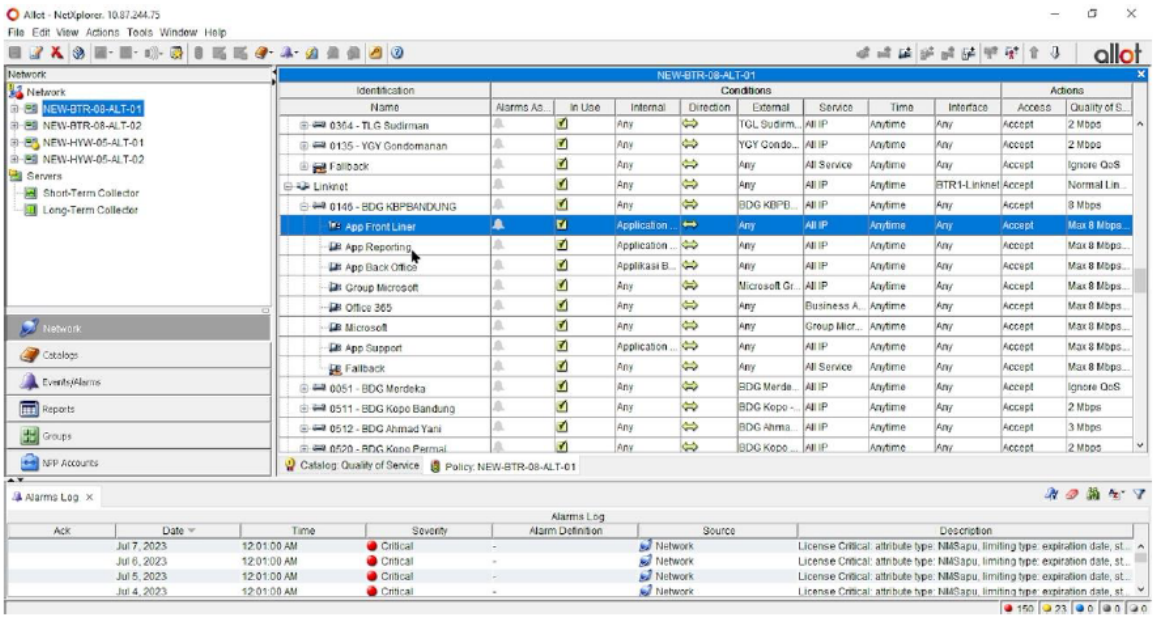

Figure 13. BDG KBPBANDUNG Branch Policy

The picture below is a statistical graph of bandwidth usage from BDG KBPBANDUNG branches that have implemented QoS for branch bandwidth restrictions.

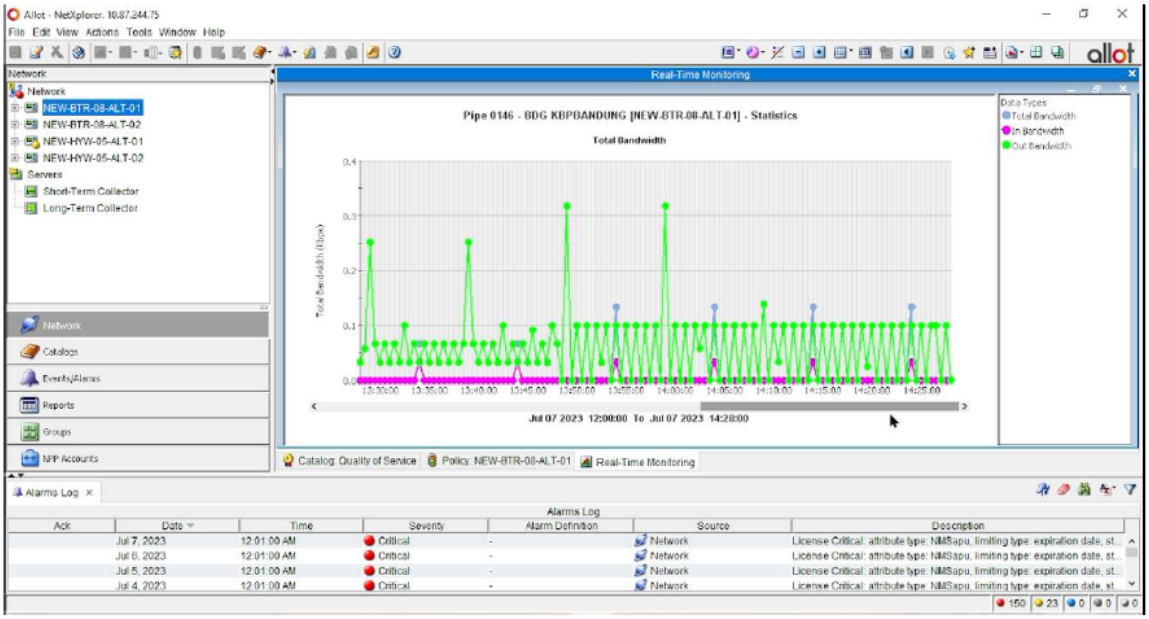

Figure 14. BDG Branch Statistics Testing KBPBANDUNG

The picture below is a monitoring graph of application usage from the BDG KBPBANDUNG branch which is still in Fallback status because there are several applications that have not been defined in the Host Catalog.

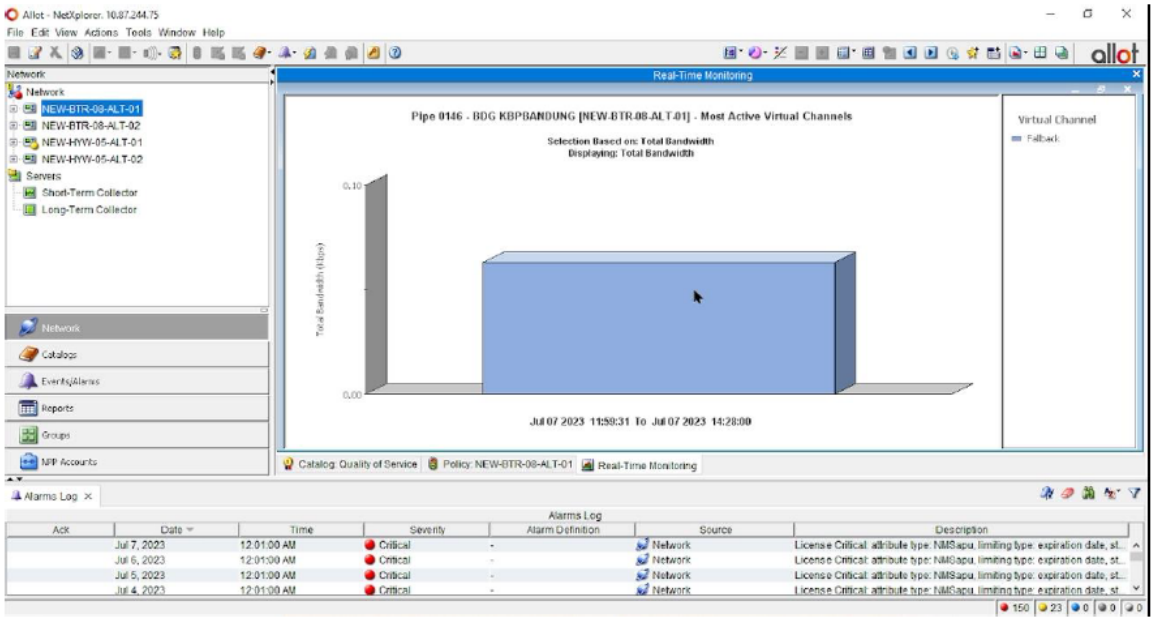

Figure 15. VC Testing BDG Branch KBPBANDUNG

The picture below is a graph of the monitoring protocol used at the BDG KBPBANDUNG branch. And see what applications have not been defined so that they are fallback state.

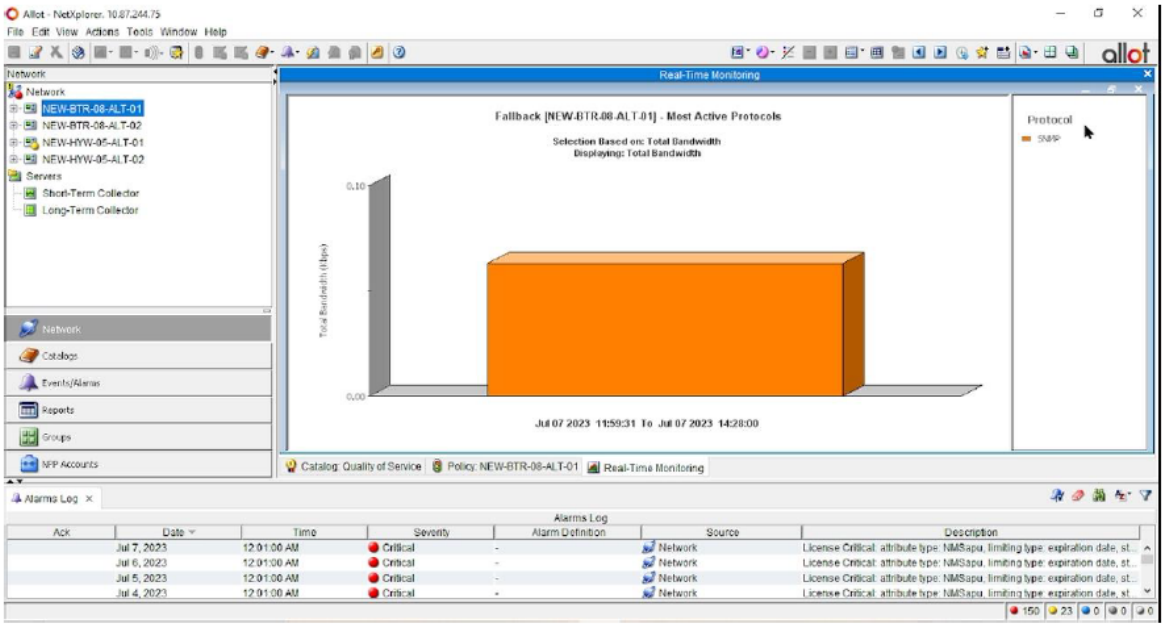

Figure 16. BDG Branch Protocols Testing KBPBANDUNG

4. CONCLUSION

In this system analysis, it can be concluded that PT. Bank Permata Tbk has no structured reports for Bandwidth usage at each branch and without any specific restrictions on Bandwidth. And with this problem, the branch application used does not run optimally. With the implementation of Bandwidth management using Allot Secure Service Gateway in the WAN network of PT. Bank Permata Tbk so that it can produce structured reports and monitor Traffic Bandwidth both branches to branch applications.

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REFERENCES

[1] Allot, "Network Traffic Management," [Online]. Available: https://www.allot.com/network-intelligence/network-traffic-management/. [Accessed: Sep. 3, 2024].

[2] A. P. Sari, P. M. "Bandwidth management using hierarchical token bucket (HTB) method at Amil Zakat Nurul Hayat Tangerang institution," *Journal of Informatics*, University of Muhammadiyah Tangerang, vol. 145-151, Jun. 2021.

[3] Indonesia Data, "Profile of PT Bank Permata Tbk," [Online]. Available: https://dataindonesia.id/profil-perusahaan/detail/profil-pt-bank-permata-tbk. [Accessed: Dec. 1, 2021].

[4] H. Kusbandono, E. M. "Application of Quality Of Service (QoS) with PCQ method for Internet bandwidth management at Madiun State Polytechnic WLAN," *Journal of Computer, Information System, & Technology Management*, vol. 7-12, Apr. 2019.

[5] I. P. Sari, S. "Analysis of the application of hierarchical token bucket queue method for internet network bandwidth management," *RESTI Journal*, vol. 522–529, 2018.

[6] J. M. Simbolon, H. H. "Computer network design for elementary school with hierarchical token bucket bandwidth management system," *Bumigora Information Technology (BITe) Journal*, vol. 56-68, Jun. 2021.

[7] A. M. Lukman, "Bandwidth management using hierarchical token bucket (HTB) method in Farid.net," *Citec Journal*, vol. 209-218, May-Jul. 2018.

[8] "Understanding Quality Of Service (QoS)," Hosteko.com, Jun. 17, 2021. [Online]. Available: https://hosteko.com/blog/pengertian-quality-of-service-qos-and-of-service. [Accessed: Sep. 3, 2024].

[9] R. Rahmawati, "Implementation of open source-based official site as a provider of news information to the association," Widuri.raharja.info, Sep. 29, 2018. [Online]. Available: https://widuri.raharja.info/index.php?title=SI1511489320. [Accessed: Sep. 3, 2024].

[10] repo darmajaya, "BAB II," [Online]. Available: http://repo.darmajaya.ac.id/7100/9/BAB%20II.pdf. [Accessed: Sep. 3, 2024].

[11] M. Reza, "Bandwidth Management," Mandandi.com, Oct. 24, 2022. [Online]. Available: https://www.mandandi.com/2021/07/manajemen-bandwidth.html. [Accessed: Sep. 3, 2024].

[12] S. Muqorobin, H. Z. "Bandwidth management usage analysis using secure service gateway to regulate data transmission speed (Case Study: PT. Mitra Servisindo Utama)," *OKTAL: Journal of Computer Science and Science*, vol. 2424-2431, Dec. 2022.

[13] S. Maesaroh, G. K. "Implementation of bandwidth management using hierarchical token bucket at PT. Indomarco Prismatama," *Journal Sensi*, Feb. 2022.

[14] S. Noviana, H. M. "Analysis of network bandwidth management at Siliwangi University by recommending the PCQ method," *Scientific Articles of Informatics Students*, vol. 129-137, Dec. 2020.

[15] V. Sugiarto, "BAB II landasan teori," docplayer.info, 2019. [Online]. Available: https://docplayer.info/91827389-Bab-ii-landasan-teori.html. [Accessed: Sep. 3, 2024].

[16] T. O. Sidqi, I. F. "The bandwidth management implementation uses the HTB (Hierarchical Token Bucket) method," *JIPI (Scientific Journal of Informatics Research and Learning)*, vol. 132–138, Jun. 2021.

[17] A. M. Tukino, "Implementation of bandwidth management using the Hierarchical Token Bucket (HTB) method," *SNISTEK 4*, vol. 102-107, Jan. 2022.

[18] B. University, "Pengertian WAN (Wide Area Network)," [Online]. Available: http://library.binus.ac.id/eColls/eThesisdoc/Bab2HTML/2013101251KABab2001/page7.html. [Accessed: Sep. 3, 2024].