

Analysis of Management Network Using Ubiquiti for Local Office at PT Rizki Inti Madani

Shafwan Abiyu Wirawan*, Arib Nawwar Tahir, Sutisna

Department of Informatics, Sekolah Tinggi Ilmu Komputer Cipta Karya Informatika, Indonesia

*Corresponding author Email: shafwanaw@gmail.com

The manuscript was received on 21 June 2024, revised on 20 October 2024, and accepted on 22 February 2025, date of publication 7 April 2025

Abstract

The rapid development of information and communication technology has increased the need for reliable, secure, and efficient computer networks, especially for companies and organizations, including local offices. In this context, stable connectivity and optimal network management significantly impact the company's smooth operation, especially when facing increasingly growing digital transformation challenges. Companies, including the Ubiquiti device, need technology solutions to ensure smooth operations and efficiency. This study aims to provide practical solutions for companies overcoming local office network management problems. This study seeks to optimize network management in companies using Ubiquiti devices, conduct an in-depth analysis of existing network conditions, and design appropriate solutions. This study uses a descriptive qualitative approach, which aims to understand the phenomena that occur in the field in more depth. This approach was chosen because of its ability to explore the meaning, processes, and dynamics that occur in a particular social context. To ensure the successful implementation of the proposed solution, here are some suggestions that PT. Rizki Inti Madani can consider. Human Resources Training and Development, considering the importance of a deep understanding of devices and centralized network management, it is highly recommended that IT technicians and staff involved in network management be given further training on using Ubiquiti and Cisco devices. This training should also include understanding VLAN configuration, QoS, and efficient network troubleshooting and monitoring techniques. Gradual Transition: to reduce the risk of operational disruption, it is recommended that the implementation be carried out in stages. The devices will first be tested in a laboratory environment to ensure the configuration is running as expected. After successful testing, the devices can be installed gradually throughout the office to minimize downtime and operational disruption.

Keywords: *Efficient, Network, Ubiquiti, Technology, Local Office.*

1. Introduction

The rapid development of information and communication technology has increased the need for reliable, secure, and efficient computer networks, especially for companies and organizations, including local offices. In this context, stable connectivity and optimal network management significantly impact the company's smooth operation, especially in facing the challenges of increasingly growing digital transformation [1][2]. For this reason, companies need technology solutions to ensure smooth operations and efficiency, one of which is the Ubiquiti device. This device is known for its reliability, ease of management, and various advanced features, making it the right choice for building and managing networks. PT. Rizki Inti Madani, as a company with a local office, faces several challenges in network management. The main problems often encountered include connectivity disruptions, uneven bandwidth allocation, and fragmented device management systems. These problems certainly hinder the company's smooth operation and increase the data security risk. Therefore, a solution is needed to optimize network management and improve overall operational performance.

Problem is the implementation of Ubiquiti devices. This device offers various superior features that can improve the performance of PT. Rizki Inti Madani's network is primarily managed through more centralized and efficient network management. Features such as real-time monitoring and more straightforward device maintenance can potentially improve the stability and performance of the company's network connection. Therefore, this study aims to optimize network management at PT. Rizki Inti Madani uses Ubiquiti devices to conduct an in-depth analysis of existing network conditions and design appropriate solutions. This study uses a descriptive qualitative approach, which aims to understand the phenomena that occur in the field in more depth. This approach was chosen because of its ability



to explore the meaning, processes, and dynamics that occur in a particular social context. Descriptive qualitative research allows researchers to reveal a detailed picture of the characteristics of the phenomenon being studied, including perspectives, experiences, and interactions that occur between research subjects. Qualitative research aims to observe the social reality constructed by individuals or groups in a particular context [3][4].

This social reality cannot be separated from the cultural, historical, and environmental contexts that surround it. Therefore, a qualitative approach considers various contextual factors influencing research results, such as values, norms, and social practices that apply in the research environment. As explained by Creswell, descriptive qualitative research is very effective for understanding complex social phenomena because it allows researchers to explore deep meaning and context [5]. This study focuses on network optimization at the local office of PT. Rizki Inti Madani using Ubiquiti devices. This study includes several stages, from analyzing the existing network to identifying key problems such as unstable connections, uneven bandwidth allocation, and fragmented device management [6][7]. Based on this analysis, planning and implementation of Ubiquiti devices will be carried out, including installing Access Points, configuring devices to improve performance, and implementing more efficient bandwidth management [8][9]. One of the leading solutions in this study is implementing centralized network management using the Ubiquiti Network Management System (UNMS) or UniFi Controller. This management system allows for more efficient device management, including real-time monitoring, device maintenance, and bandwidth allocation management. This research will also focus on improving network security with firewall configuration, security policies on router devices, and network segmentation to minimize potential threats to system integrity [10]. This research aims to provide a practical solution for PT. Rizki Inti Madani in overcoming their local office network management problems. By using Ubiquiti devices, it is expected that the company's network can be optimized to support smooth and efficient operations. In addition, this research aims to improve the technical competence of researchers by applying the knowledge gained in the context of the real world of work.

2. Research Method

The methodology used in designing this network system is based on business, and technology needs analysis, with a systematic approach that includes analysis of the current system conditions, problem identification, and design of optimal solutions to improve network efficiency and performance. This process consists of several critical stages, which will be explained below. Existing System Analysis: An in-depth analysis of the network system currently operating at PT is performed at this stage. Rizki Inti Madani is carried out through structured and systematic steps. Data was collected using direct observation methods and in-depth interviews with related parties, such as IT technicians, network managers, and network users. The aim is to obtain comprehensive information regarding the current network conditions, the devices' specifications, and technical and operational problems that often occur. Based on the data collected, several significant issues were found, including frequent connection disruptions, low work efficiency due to slow network access, and less-than-optimal utilization of network devices. In addition, the analysis also revealed a mismatch between the company's operational needs and the available network capacity [11][12].

SWOT Analysis: At this stage, a SWOT analysis is conducted to identify the strengths, weaknesses, opportunities, and threats PT faces. Rizki Inti Madani in network improvement efforts. The company's strengths include basic network infrastructure that is already available and human resources who have a basic understanding of network technology. However, there are weaknesses in limited devices used and network management that are not yet centralized, which hinders operational efficiency. There is an excellent opportunity to implement modern technology, such as Ubiquiti devices, which can improve the efficiency and scalability of the company's network. However, some threats need to be considered, namely budget limitations that can hinder the implementation process and possible disruptions during the Transition from the old system to the new system. SWOT analysis is a practical strategic tool for evaluating internal and external factors that affect an organization's ability to achieve its goals. In addition, Kotler and Keller emphasize that identifying external opportunities and threats and internal strengths and weaknesses is very important for formulating competitive and sustainable strategies [13]. After analyzing the existing problems, the next stage is to design a system solution that can overcome the problems using appropriate devices and technologies. The first step is the network topology design, which proposes using a hierarchical topology (core, distribution, access layer) to improve the scalability, management, and efficiency of the network as a whole. Next, the device selection is carried out by considering the needs that have been analyzed and choosing a combination of Cisco devices for routing and switching and Ubiquiti devices for network management and access points. Before implementation on the actual network, configuration testing is carried out in the laboratory (lab testing) to ensure that the designed solution can function properly and meet the company's needs. After the configuration test is successful, the next stage is implementing the system on the PT. Rizki Inti Madani network. At this stage, IT technicians will install network devices according to the points determined in the previously prepared topology design. After the new network is ready to use, the next stage is migrating from the old system to the new one. The migration process begins by moving users to the optimized network, which includes resetting the IP configuration and accessing various network services, such as the Internet and internal applications. After the implementation, periodic system performance monitoring is carried out to ensure the network functions correctly and meets expectations [14][15].

3. Result and Discussions

Currently, PT. Rizki Inti Madani uses a network system that relies on separate conventional devices that have not been optimally integrated. The existing network system consists of a standard router from the ISP, an unmanaged switch, and an access point directly connected to the router without any separation or centralized control, as seen in Figure 1, which illustrates the topology and flow of existing data traffic. The main problems found in this analysis are Connection Disruption and frequent slow or intermittent connections because the devices used are not designed to handle high data traffic loads. This condition causes inconvenience to users, disrupts team member productivity, and causes a decrease in service quality. Low Work Efficiency: the network maintenance process is carried out manually, without software to monitor and manage the network, extending the recovery time from disruptions and disrupting business operations. In suboptimal Device Use, many devices are currently not optimally utilized; for example, features such as VLAN, quality of service (Quality of Service), and network monitoring are very much needed to maintain network performance and security.

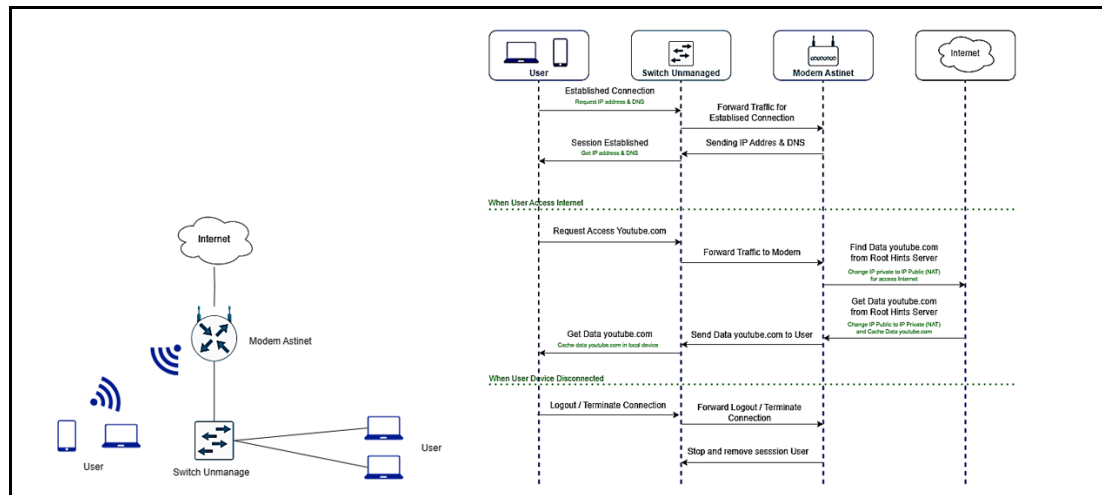


Fig 1. Topology dan Traffic Flow Existing

Based on the SWOT analysis matrix, PT. Rizki Inti Madani has several strengths that can be utilized to optimize the network system. The existing basic infrastructure is a good foundation for further development. In addition, a team of technicians with a basic understanding of networks and a strong company commitment to network improvement provides advantages in implementing changes. However, weaknesses such as outdated devices, lack of centralized network management, and minimal network security must be addressed immediately. Budget limitations and possible disruption during system transition are threats that must be considered carefully. On the other hand, the excellent opportunity for implementing Ubiquiti devices provides solutions to many existing problems, especially in terms of more efficient network management, increased productivity, and readiness to face future technological developments. However, the challenges of limited budgets and disruptions during system migration need to be managed carefully to minimize the impact on operations.

The impact analysis entitled Impact Analysis Matrix shows how business, information, and technology needs can be met through the proposed solution. This matrix illustrates the solution's impact on each organizational need and prioritizes it based on the level of impact and potential problems that may arise. First, business needs such as connection stability, operational efficiency, and corporate data security can be met with a centralized network management solution and devices that support modern technology. Second, information/data needs, such as real-time network monitoring and performance reporting, can be addressed with software that provides an easy-to-use interface and early detection capabilities for network problems. Third, technology needs that include centralized network management, device scalability, and bandwidth distribution optimization can be achieved by implementing the Ubiquiti platform, which allows efficient and flexible device management. Thus, the proposed solution not only meets basic operational needs but also significantly contributes to improving overall network performance and management. As for the Function Specification, the proposed network management system will include various essential functions, including the ability to manage devices centrally. In addition, this system will provide flexible access to various security and network monitoring features and support optimal bandwidth settings to ensure maximum network performance. These functions will improve the effectiveness of network management and support the company's goals of improving operational stability and efficiency.

Based on the analysis done on the network system running at PT. Rizki Inti Madani, it can be concluded that the current network infrastructure is not optimal in supporting the company's operational needs. The devices used, such as standard routers from ISPs, unmanaged switches, and access points integrated with default routers, cause several significant problems, such as connection disruptions, low operational efficiency, and lack of utilization of advanced features that can support automatic network management. Through SWOT analysis and Impact Analysis Matrix, it was found that the proposed solution, namely the implementation of modern network devices such as Ubiquiti UniFi and Cisco ISR, with a hierarchical topology, can significantly overcome these problems. Modern technologies such as centralized network management, VLAN, quality of service, and real-time network monitoring can improve network performance, speed up response to disruptions, and improve company data security. In addition, centralized network management will provide convenience in monitoring, troubleshooting, and bandwidth management, improving overall operational efficiency. With a more efficient system, PT. Rizki Inti Madani can reduce network downtime, increase team member productivity, and reduce the risk of disruptions that can affect company operations. The implementation of this modern device will also prepare PT. Rizki Inti Madani to face future technological changes, ensure the network remains scalable and can handle the growing number of users. To ensure the successful implementation of the proposed solution, here are some suggestions that PT. Rizki Inti Madani can consider. Human Resources Training and Development, considering the importance of a deep understanding of devices and centralized network management, it is highly recommended that IT technicians and staff involved in network management be given further training on using Ubiquiti and Cisco devices. This training should also include understanding VLAN configuration, quality of service, and efficient network troubleshooting and monitoring techniques.

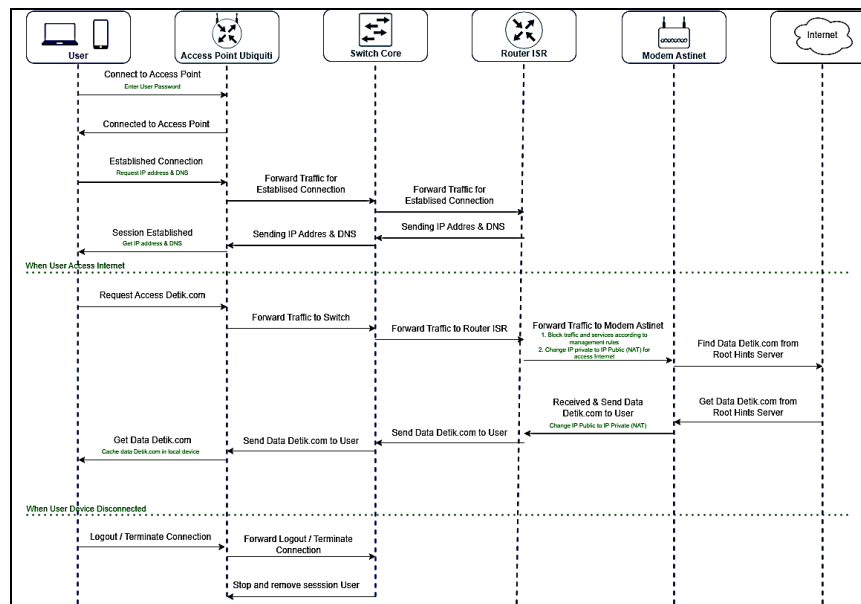


Fig 2. Flow Map Diagram



Fig 3. Topology dan Traffic Flow Existing

To meet the needs of a stable and secure network, the technical specifications used consist of various hardware, including the Cisco ISR4321/K9 router, Cisco Catalyst WS-C3750 switch, and Ubiquiti UniFi U6-Pro-ds access point. These devices were selected to support centralized network management, optimize wireless connections, and improve operational capacity and efficiency. The flow map diagram shows the data flow and processes in the proposed network system. The process begins with user verification through the Ubiquiti Access Point, setting the IP address, and routing to the Internet through the Cisco ISR4321/K9 Router. The activity diagram describes the sequence of activities in the network optimization process, from topology design and devices to be installed to network migration and monitoring after implementation. The proposed topology uses a hierarchical topology to divide the network into several layers (core, distribution, access), facilitating network scalability and management. Each layer has a specific function to improve efficiency and security. The role and access matrix is used to manage user access rights to the network system, including admin access for the primary device, IT technician access for maintenance, and regular user access for internet connection; there are three accesses provided, namely Admin (full access to router, switch, and controller devices), IT technician (access for device maintenance), Regular user (access to the Internet via Wi-Fi network).

4. Conclusion

To ensure the successful implementation of the proposed solution, here are some suggestions that PT. Rizki Inti Madani can consider. Human Resources Training and Development, considering the importance of a deep understanding of devices and centralized network management, it is highly recommended that IT technicians and staff involved in network management be given further training on using Ubiquiti and Cisco devices. This training should also include an understanding of VLAN configuration, quality of service, and efficient network troubleshooting and monitoring techniques. Gradual Transition. It is recommended that the implementation be carried out in stages to reduce the risk of operational disruption. The devices will first be tested in a laboratory environment to ensure the configuration is running as expected. After successful testing, the devices can be installed gradually throughout the office to minimize downtime and operational disruption—enhanced Security Infrastructure. Although the proposed centralized network solution already includes security features such as VLANs and firewalls, adding additional layers of security such as VPN (Virtual Private Network) for remote connection

protection and multifactor authentication for critical device access is essential. This will strengthen protection against external and internal threats.

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