E-Monitoring Microtic Network uses The Dude in Musamus University

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Abstract. This study aims to carry out the monitoring process of wireless local area network (WLAN) microtics using the Dude application at Musamus University. It is expected that the monitoring results can be in the form of messages / notifications to network administrators. Network monitoring will be increasingly difficult if the computer network topology in an institution is very broad and complex. The network devices used in this study are the Mikotik operating system with the Dude tools with the specifications of Mikrotik RB433, The Dude server and The Dude Client. Based on the results of the implementation and testing carried out on the WLAN network of Musamus University, it was found that the use of The Dude Application can make it easier for network admins to know the position of the proxy router that has trouble, up and down on the proxy router. Another advantage is that the admin simply monitors the network on the server because if there is trouble or the system down the admin gets a notification in the form of an email from the Dude.

1. Introduction
In supporting the process of learning activities, information technology is needed, the internet network Wireless Local Area Network (WLAN) is one of the supporters in the process of data processing activities, especially in universities. Along with the development of universities and the use of information, the number of wireless access points has increased according to location and location, so that accessing the network admin will have difficulty memorizing locations, names of access points, and IP (Internet Protocol) addresses of Wireless Access Points (AP) available and the admin cannot know which access point is interrupted, so the admin must check the access point one by one if a problem occurs. This study aims to assist admin in monitoring WLAN (client - server) networks with proxy devices and The Dude.

WLAN network administrators in providing services to users are expected to be able to provide maximum service so that it does not interfere with users if there is a user whose connection is lost. An implementation of a network monitoring system uses email notifications to administrators which include service to each client. The Dude application as a warning gate system that uses a Simple Mail
Transfer Protocol (SMTP), which functions as an alternative service message service if a problem occurs or a decrease in bandwidth causes the internet to break up, if these things happen there will be an email notification sent to the administrator [1]. Disconnection of communication between WLAN networks greatly hampers the performance of an institution if it is not handled properly. At present network management is a very feared task, to ensure that the network built is running well needs to arrive at how to build and optimize networks [2]. Network Monitoring System (NMS) allows the admin to monitor nodes, both Routers IP, IP keys. NMS can monitor network status both up / down connections through the system directly using SMS text messages, cellular phones [3].

The efficient and automated use of network monitoring is always needed for large organizations such as universities, companies and other business sectors [4], [5]. In organizations that have a large scope always need a network monitoring system immediately before network problems arise, a fast and efficient network monitoring system that can report to network administrators immediately can be via e-mail or sms when the network is down. Notification of notifications will generate tickets in the database by informing node problems and their effects on the network side [6]. The key role in network management is done by software that can be implemented on a variety of organizational needs, providing multiple user interfaces, authentication and authorization for organizations [7].

A research result describes the benefits and how network monitoring needs to be done in an academic institution and company organization in order to survive for a long time and provide security guarantees to users of viruses and hackers. In most organizations and especially academic institutions it is very important to limit network traffic [8].

Network supervisors are not only tasked with monitoring physical networks and host devices such as routers, bridges, hubs and computers, but also care about services that are running on some network-connected devices. This service can be in the form of data storage services, data manipulation, and information services that need to be monitored using tools [9].

2. Method

The method of developing a microtic network e-monitoring system uses the dude, based stage of the system development life cycle. The application was developed aimed at monitoring network systems online [10]. With the stages of activity shown in Figure 1.

![Figure 1. Research methodology](image_url)

The method show in Figure 1 has the steps described as follows:
1. Requirement Analysis, is an activity to analyze user and system requirements in full, for application development needs.
2. Data Collection, takes data collection according to user and system requirements.
3. System Design, design is done after the needs are collected in full.
4. Implementation, stages of implementing e-monitoring applications that have been made in detail.
5. Testing, is an activity of uniting application unit, then testing is carried out thoroughly.
6. Deployment of System, activities operate applications in their environment and carry out maintenance.

The development of E-Monitoring microtic network uses the dude is expected to help improve the quality of internet network services as Musamus University. To find out the application is in accordance with the objectives of the study, the questionnaire research dissemination in carried out which contains questions related to the application of the system in its environment. This method is used to get the satisfaction of the information presented by the system.

3. Result and Discussion

3.1 General Description of The System

The topology in Figure 2, is a network with a simple topology and will monitor with the dude application, on the topology above the dude application and some devices that will be monitored are in the same network. From the ping measurement result, throughput can be calculated so that throughput comparison chart between access point mode and router access point mode can be made [11]. This is the basis of the development of e-monitoring to be made. In Figure 2, there are several components, namely server, microtic board, and personal computer.

![Figure 2. General Descriptions](image)

3.2 System Architecture

System Architecture is used to describe or express the relationship between system components. The relationship between components will show the functionalities of each component and its role. In the microtic network e-monitoring system architecture using the dude, the microtic master will be installed by the dude server as a monitoring server. The dude client will connect to the dude server, where every configuration action is performed on the dude server and the dude client only displays image in the form of network maps Shown on Figure 3.
3.3 Context Diagram

The monitoring method on the current system can only be done by entering the system. Monitoring is
one online, with this system network monitoring can be done anywhere and anytime, as long as the
user is connected to the internet and accessing the system. The application of online monitoring
process aims to get updated information on the condition of the Musamus University internet network
in real-time. Figure 4, describes the context of the monitoring process diagram on the proposed
system. The system provides facilities for searching for information about network problems that are
problematic. If there is a disturbance, the system will provide interference notifications via email in
real time.

![E-Monitoring application architecture](image)

Figure 3. E-Monitoring application architecture

![Context Diagram](image)

Figure 4. Context Diagram

3.4 System Testing Result

System testing is part of the most important software development cycle. The aim is to detect sytem
failures that have been formed, so that defects can be restored and repaired in the initial phase.
Software testing is the process of confirming that the software system that has been created is a quality
product that works according to specifications and satisfies user needs. E-monitoring testing using the
The blackbox method is used to find out whether the system can work in accordance with the functional requirements of a predetermined system or testing inputs and output. A software testing technique, where in the internal workings of the product are tested unknown to the tester.

In Table 1, it shows the functional requirements of the system that have been tested after the system implementation stage. If the functional requirements of the system described are met by the application, then the Yes column will be marked (√). But if it is the opposite, then in column No. will be marked (×).

Table 1. Blackbox testing for functional system requirement

| No | Functional System Requirement                                                                 | Yes | No  |
|----|-----------------------------------------------------------------------------------------------|-----|-----|
| 1  | Monitor Musamus University internet connection online using the dude                           | √   | -   |
| 2  | Remote internet connection uses the dude online                                                | √   | -   |
| 3  | Connection termination on the microtic router board client, using the dude                    | √   | -   |
| 4  | Notification when an internet connection is interrupted, which is sent using e-mail           | √   | -   |

4. Conclusion

1. Network e-monitoring using microtic and the dude has several service facilities that can be used, including monitoring internet network connections, remote internet network connections, turning off internet network connections, and having e-mail notifications when a disturbance occurs.
2. Testing of the network e-monitoring system using microtic and the dude shows that all functions and facilities provided are running well.

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