The Implementation of Alert System for LAN Network Monitoring Using the Dude Based Email

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The Implementation of Alert System for LAN Network Monitoring Using the Dude Based Email

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Abstract. A monitoring system using The Dude with email notification as the alert is possibly an effective monitoring system for administrators covering services to every client. In addition, this system also enables to monitor the status changes particularly outside the monitoring area since email is easily accessible nowadays through smartphones and any other devices. Using the Dude as a gateway for the system alert promoting Simple Mail Transfer Protocol (SMTP), the system functions as an alternative messaging service that informs if there is troubleshoot or other activities such as bandwidth decrease causing to internet disconnect. If such things happen, there will be email notification sent to the administrators.

1. Introduction

In maintaining a network, monitoring and alert systems are needed in order to control the network as well as a system that can monitor network condition by using alarm system or other systems as an alert in monitoring area. For monitoring activities to work more effectively, network administrators need alert systems that can report on network status when network administrators are not in the monitoring area.

One of the research discussing monitoring system in a computer network was "Network Mapping System Design of Network Monitoring" written by V. Bima Anong Dian Hutama, Achmad Affandi, dan Eko Setijadi, Electrical Engineering, Faculty of Technology and Industry, Sepuluh Nopember Institute of Technology Surabaya (2013) discussing a network mapping system design in NMS functioning as Performance management [1]. This network mapping system is an automated system using SNMP and Web Architecture The network mapping process will detect network devices automatically. Another research related to network monitoring is " The analysis and implementation in Internet Data Traffic Monitoring System using Cacti, JFFNMS and The Dude" written by Goeritno, Informatics Engineering Department, Faculty of Communication and Informatics Muhammadiyah University of Surakarta (2013) discussing three network monitoring devices: Cacti, Just For Fun Network Management System (JFFNMS), and The Dude applied for monitoring taking place in PT. Lintas Data Prima ke UMS. Then the three devices were compared to analyze their performance and facilities [2-5].

This research develops a monitoring system by designing a monitoring system using The Dude with Email as Alert System notification, this Alert monitoring system will make it easier for administrators to receive network reports when the network administrators are out of the monitoring area, Email will function as Gateway Alert System. Email-based monitoring was chosen to get indefinite access6-9].

2. Methods

These are the steps carried out in this research:

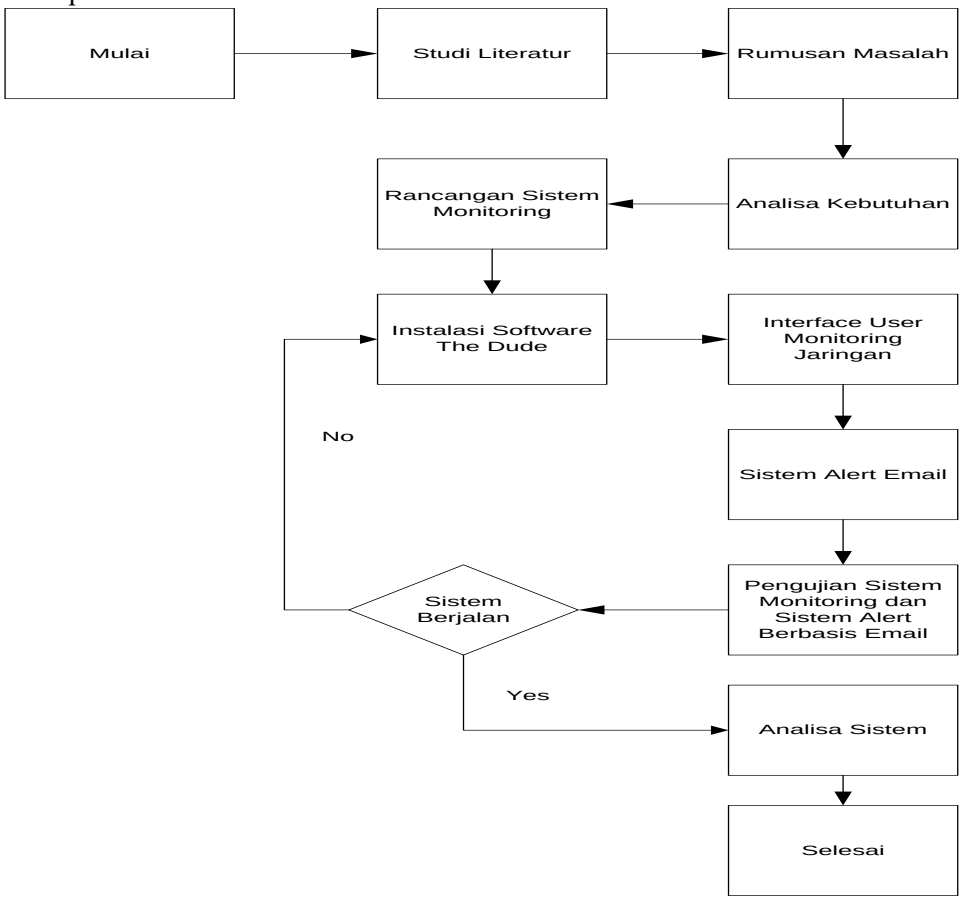

Figure 1. Research Method Flowchart

The research methodology used in this research is based on the increasing size and number of network devices, the more complex the problem on the network, so there is a need for continuous supervision to ensure the availability of services. Alert system can be used to monitor the network and can report the state of the network by using the alarm system or other systems as alert in the monitoring area [10-12].

The effectiveness of network monitoring activities is the basis of this research by using alert systems that can report network status when the network administrators are outside the monitoring area, and network administrators need an alternative system or technology to help them get information about their network connection status quickly and accurately. The technology that can be used is Email technology that contemporarily its use can be accessed anywhere through mobile phones and other computer devices. Email technology was set as the system alert gateway functioning as alternative message transmitter to notify troubleshoot or such other activities as bandwidth interruption that may disconnect client from server. by this means, network administrators will automatically receive notification Email [13].

The software monitoring system used in this research is The Dude, an application that can set up network system, The Dude will automatically and quickly read all devices / computers connected in a local network. Thus, the results of this design can be used by administrators in monitoring the network.

3. Design and Implementation of LAN Network Monitoring

The design and implementation of The Dude in a network is used to allow users to apply networks design manually or by using network discovery tool. The dude can be used to monitor service in every network host/client or server and send notification alert for every status change as shown in figure 2

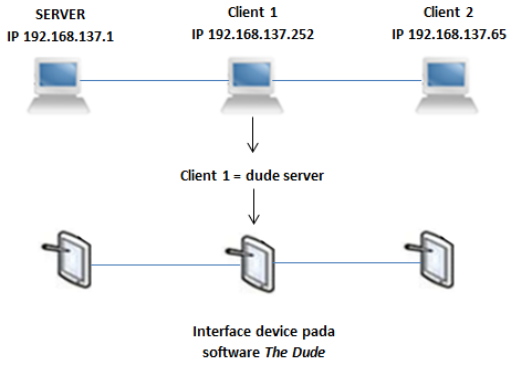

Figure 2. The design of LAN network monitoring system in The Dude.

In Figure 2, there are 3 PCs namely server, client 1 and client 2. in the LAN Network, the monitoring system is Client 1 that serves as Dude sServer or in PC where The Dude is installed. In Dude server, LAN network configuration can also be done so that the Interface Device can be monitored from the thee PCs [14].

3.1. Dude Server Implementation

Dude server is an application that runs in the background, it is not in the computer that runs it. Monitor the network continuously for 24 hours. Dude server design on the monitoring system The Dude is using Laptop client 1. In addition to the client / host, client 1 is also used as a Dude server that controls and monitors the LAN network.

Figure 3. PC Chart as Dude Server

In Figure 3, PC was used as server and The Dude must be installed in that PC to create interface device in LAN network. this was done to monitor the devices in the network with various services such as dns, http, notification and so on. In addition, the configuration process can only be done in Dude server [15].

3.2. Interface Device Implementation

In the implementation, this LAN network represents network computer system allowing the users to create network scheme either manually or automatically (using automatic network discovery tool) into

a more convenience graphic. The following figure describes interface device design implemented in The Dude monitoring system

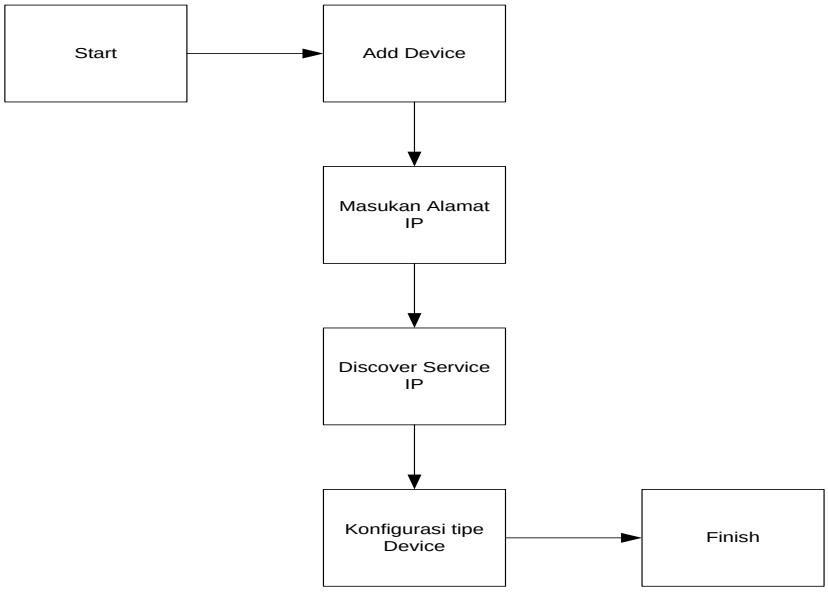

Figure 4. Interface Device Flowchart

In Figure 4, the first step in creating interface device is by choosing "add Device", Enter the IP Address of each device, then discover service in each IP device to see the available service, and last, choose device type as host/client, server or other device and place the interface device on the worksheet.

3.2.1. Sever Device Design the Device used as the server functions as internet/web server service provider. In this LAN network design, the device used as the server is a Handphone, and the IP from the device that will be monitored is 192.168.137.1. and enter the IP in the add device page.

3.2.2. Client Device Design. Client Device or host serves as clients in the LAN network, client device use bandwidth as a hotspot from the server to client. There are two client devices in this LAN network, they are:

- IP Client 1 = 192.168.137.252
- IP Client 2 = 192.168.137.65

3.3. Email Gateway Alert System Design

To monitor the device and link, network monitoring system is needed to detect any interruption outside the monitoring area. for this purpose, gateway email was added as the notification in The Dude Software that will send email notifications if there are some problems in the device status.

3.4. The Implementation of Email Gateway as an Alert System

Networks often experience device or network interference. to find out which device or links are experiencing interference, a network monitoring system application is needed to detect that interference. Monitoring process is usually only within the monitoring area but when outside the monitoring area, monitoring process cannot be done. As a result, the email gateway is made as a notification on The Dude, the following figure describes the flow of gateway email and its configuration

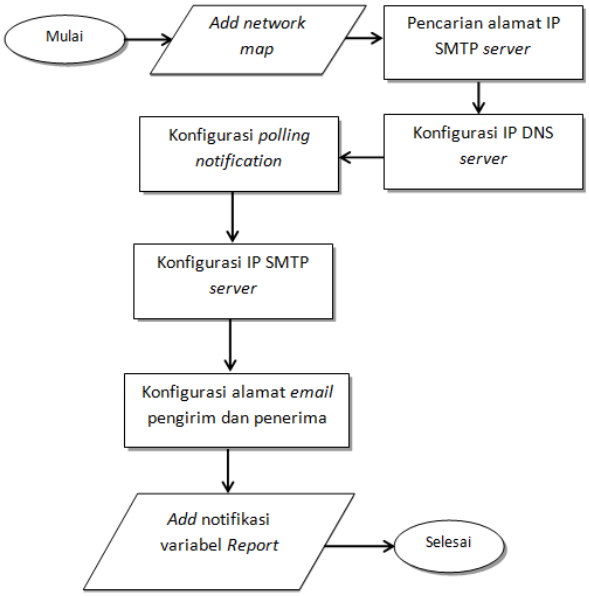

Figure 5. Gateway Email Flowchart as an Alert Notification System

3.5. Monitoring System Implementation

The implementation was done by switching on/off one device, the light indicator will change along with the service status notification.

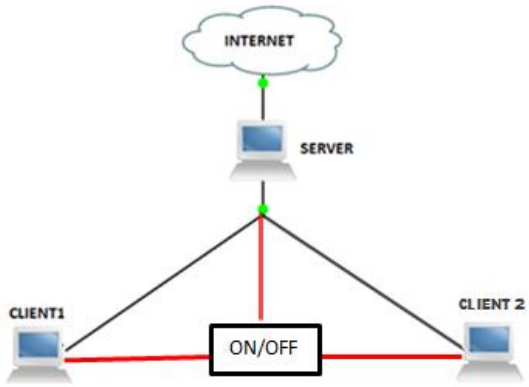

Figure 6. Network monitoring system run test scenario

There are some indicators based on the device color:

- Green: the service is running well
- Orange: some services are not running well
- Red: the services are off

the following result presents the experiment of shutting down client 2

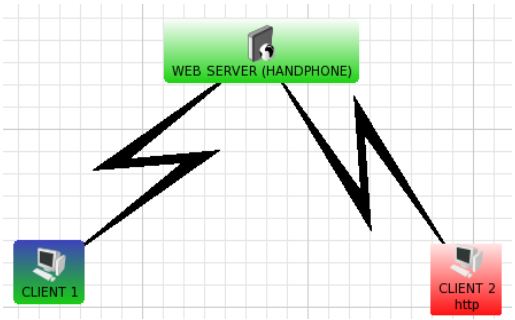

Figure 7. Server Device Client 2 Run Test

4. System Analysis

4.1. Alert System Response Analysis

Response analysis was carried out to compare responses from both systems in different probe times. The data obtained in analyzing both systems were taken from client 1 with probe time interval in monitoring system, probe time out and probe down [16].

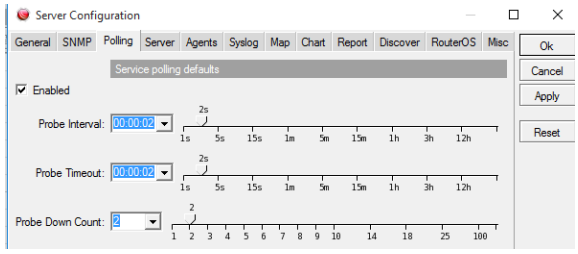

Figure 8 Alert System Analysis with Probe Time

Figure 8 shows the configuration interface of the polling server, at this interface when the probe time is set, there are several options in setting the probe configuration i.e. with units of seconds, minutes, up to hours. In this analysis the probe configuration is set in seconds from 2 seconds to 60 seconds / 1 minutes, and in this analysis the comparison of these two systems is done 10 times, by turning off client 1 as the object of data retrieval. The following table shows the response analysis result from both systems

NO	PROBE TIME INTERVAL	PROBE TIME OUT	PROBE DOWN COUNT	RESPON REPORT EMAIL	RESPON REPORT SYSLOG
1	2	2	2	Tidak	Sesuai
2	5	5	5	Tidak	Sesuai
3	10	10	10	Tidak	Sesuai
4	15	15	15	Tidak	Sesuai
5	20	20	20	Tidak	Sesuai
6	25	25	25	Tidak	Sesuai
7	30	30	30	Tidak	Sesuai
8	35	35	35	Tidak	Sesuai
9	50	50	50	Tidak	Sesuai
10	60	60	60	Tidak	Sesuai

Table 1. Response System Data Comparison

4.2. Report System Analysis

Report analysis was done to compare the accuracy of the system in the reporting network conditions, network report is a service from the device on the network, the comparison report system is done on offline client 1. The following table describes the data from the experiment.

NO	STATUS CLIENT 1	HASIL REPORT EMAIL	HASIL REPORT SYSLOG
1	MATI	DUDE, NETBIOS, HTTP DOWN	DUDE, NETBIOS, HTTP DOWN
2	MATI	DUDE, NETBIOS, HTTP DOWN	DUDE, NETBIOS, HTTP DOWN
3	MATI	DUDE, NETBIOS, HTTP DOWN	DUDE, NETBIOS, HTTP DOWN
4	MATI	NETBIOS, HTTP DOWN	DUDE, NETBIOS, HTTP DOWN
5	MATI	DUDE, NETBIOS, HTTP DOWN	DUDE, NETBIOS, HTTP DOWN
6	MATI	NETBIOS, HTTP DOWN	DUDE, NETBIOS, HTTP DOWN
7	MATI	DUDE, NETBIOS, HTTP DOWN	DUDE, NETBIOS, HTTP DOWN
8	MATI	DUDE, NETBIOS, HTTP DOWN	DUDE, NETBIOS, HTTP DOWN
9	MATI	NETBIOS, HTTP DOWN	DUDE, NETBIOS, HTTP DOWN
10	MATI	DUDE, NETBIOS, HTTP DOWN	DUDE, NETBIOS, HTTP DOWN

Table 2. Report system data comparison

From the table above, there is a difference between the two alert systems in the state of the network, With the percentage of success / accuracy of syslog report of 100% while the email has 99.7% report accuracy with 0.3% error report from ten experiments.

In the 4th, 6th and 9th test the results of the report service differ from the syslog report, this is because the mail gateway system has several filter processes in receiving messages from the Dude server so that some data is lost, as evidenced by the entry of email reports to spam. The following is the result of experiment from both systems in the network as well as the email photos that went into spam due to the process of the mail server filter.

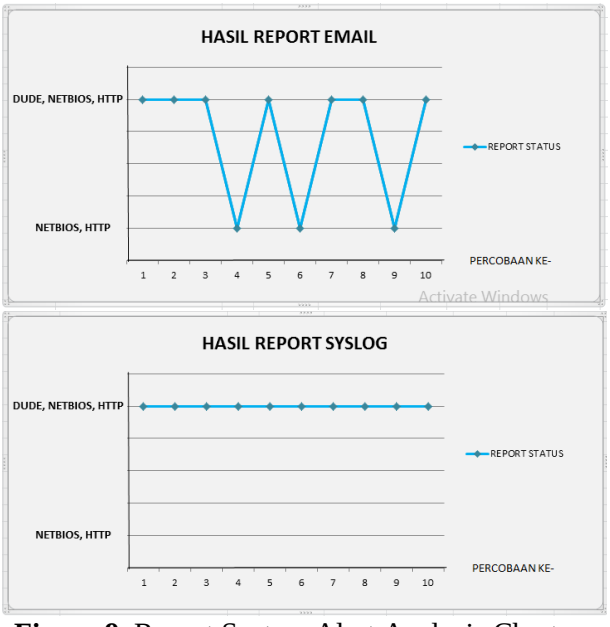

Figure 9. Report System Alert Analysis Chart

5. Conclusion

The conclusions of this research are:

- The Dude was successfully implemented in LAN network. It was confirmed from the ability of The Dude in displaying Service interface for each device and the success of gateway email as a network alert system.
- The results of the LAN network monitoring system run well when the device is turned off / turned on with a color indicator that turns red when it is off and green when it is on. The result of the test of device response was done 10 times with different probe time response settings. The result is that the email alert system does not match the probe response time which is set to 0% but syslog has the corresponding response with probe time with 100%. This is because email can

respond to any interference on the network after a report from syslog which is an application from The Dude providers is available. Likewise, on the trial report system alerts conducted 10 times. The result is the percentage of email alert system success in reporting interrupted service device is 99.7% in comparison with syslog with 100%. Email reports sometimes do not match syslog because of the existing filtering on the Gmail server.

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