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Network Server System Maintenance Using Zabix On SNMP and Analytic Room Data Network in 2024 Diskominfo Bengkayang District

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ABSTRACT - To maintain a network, network administrators need network monitoring. Recent technological advancements enable Zabbix-based monitoring systems in conjunction with the SNMP protocol for network monitoring. The purpose of this research is to see and use routers to show web content. A common issue is that there are not enough administrators, and the network monitoring system is not set up properly. Goals are being set with this research to assist network administrators in resolving issues more rapidly by keeping an eye on their current networks. Zabbix is an open-source monitoring tool used in this investigation. Information from network devices, including traffic data, bandwidth usage, and network interface, can be shown by this program. The outcomes of the conducted trials have demonstrated the ability to monitor Zabbix SNMP-based network monitoring software shows the anticipated outcomes. The monitoring system on the Zabbix application is running, which is an indication of this. It is envisaged that by utilizing Zabbix-server to build a network monitoring system, issues will be easier to solve quickly and act as a baseline for the system under development.

INTRODUCTION

The development of information technology is very important to support activities in searching for information and to be able to complete existing problems. Network monitoring is a functioning system to monitor activity on network devices. Rapid technological progress raises many complex problems that are not easy to solve simplified [1]. The Department of Communication and Information (Diskominfo) has a network infrastructure that allows all activities to run according to the rules of tasks and ongoing activities. However, system management activities Network maintenance and analytic room data are a problem for Diskominfo in carrying out all its activities [2]. Data Analytic Room is a means of analyzing and monitoring data-based development. It is hoped that it will speed up and make it easier to provide visual data so that it can provide supervisory explanations and evidence regarding a problem and as a reference in making a more in-depth and detailed analysis for making decisions [3].

The problem that often occurs is network maintenance I'm having trouble. Network problems at Diskominfo frequently occur when there is an unstable electric current or a power outage, so when the power goes out, the central server cannot immediately restart the system. Because of the complexity of this supervision, many problems arise due to it The operational stability of the network cannot be known directly by the network administrator. Network troubleshooting becomes a tough task for a network administrator, considering that in one Diskominfo building Only one administrator can manage all this information on the network. It takes a long time to work on the network when experiencing problems two to three days depending on the level of complexity [4].

The number of servers located at Diskominfo, namely as many as 1 active server. Each computer room has approximately 20 computers supported by interconnected network devices. These network devices include switches, routers and access points. The large number of computers and network devices

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means that a network administrator needs to have a network monitoring system. This system is useful for viewing all devices connected to the network, so you can make it easier to check the network if troubleshooting occurs, starting from computer devices, routers, VoIP networks, and existing network devices [5].

The system is designed and installed as well as configured to monitor the resource usage of servers in real-time, and then check whether the network system is working properly or not. In this research is carried out to design a network monitoring system at Diskominfo Bengkayang District. Zabbix monitoring is a monitoring technology, The Zabbix network monitoring system is very effective and is an open-source product that is easy to obtain, Zabbix also has an alarm or notification so it distinguishes it from its competitors [6]. Of course, this Zabbix monitoring agent can also function as a network status monitoring system, on network hardware or servers or applications. The network monitoring system uses Zabbix-server, which can analyze and show network data traffic spread across a building area so that network administrators will find it easier to manage the quality of the available network [7].
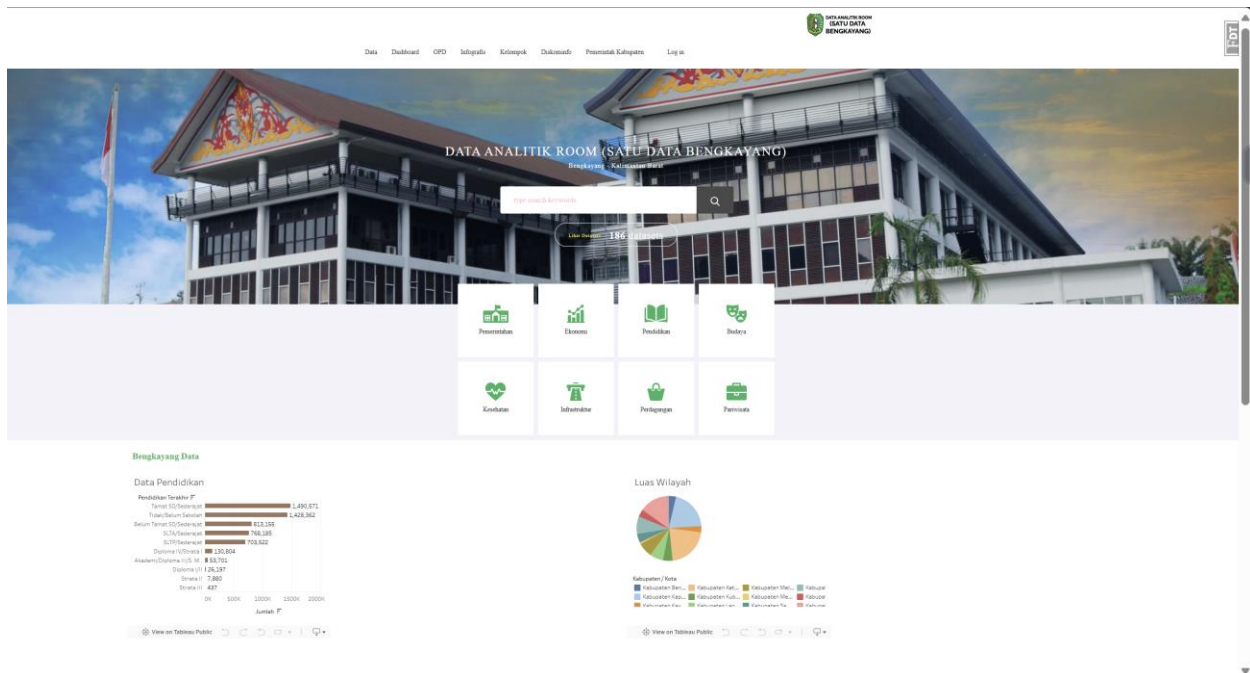

Figure 1. Analytic Room Data Diskominfo Bengkayang District

Figure 1 above is the analytic room model, it can be accessed using http, not using https because there is no SSL on this server. It is installed on a PDN server. If you access it here, there is an introduction to the config, request, template, logging, version, HTTP and so on models. If you look at the data there is a query button [8].

MATERIALS AND METHODOLOGY

The software development method is a method used to develop software as a solution to the problem being studied, being researched. At this stage, system development is carried out by needs using the Prepare, Plan, Design, Implement, Operate and Optimize (PPDIOO) method [9]. Optimize (PPDIOO). The scheme of this research method is shown in Figure 2.

Figure 2. PPDIOO Methodology Scheme [10]

Implementation of a network monitoring system using Zabbix based on SNMP-based Zabbix has a system application that can later develop a monitoring system that is built to provide detailed network information. a Monitoring system that was built to provide network information in detail and real-time [11]. The development of this network monitoring system is expected to facilitate an administrator in managing a computer network [12]. The first stage in this research is preparation, at this stage the organizational and business needs are determined, which are used to prepare the network [13]. This stage determines the organizational and business needs, which are used to develop a network strategy and propose a network architecture concept [14]. Develop a network strategy and propose a high-level network architecture concept with a high level, to support a strategy that is supported by the financial capabilities of the organization or company [15] financial capabilities of the organization or company [16]. The second stage is Plan in this phase network requirements based on network needs, facilities, and objectives are identified. This phase also details the characteristics of the network, comparison of potential and actual performance is described. Development of a plan for task management, several stakeholders involved and responsible, as well as the design and implementation by all resources [17] implementation performed by all resources [18]. Hardware requirements require a hard disk capacity of 500 GB so that it can be more easily accessed online. In accessing the need for network monitoring must have one Public IP so that it can be accessed from anywhere as long as the device is connected to the network. Accessed from anywhere as long as the device is connected to the internet or local network. The contribution of this research lies in the device that is used for network monitoring. Table 1 shows the specifications to support a monitoring server when running, which allows processing network administrator activities in accessing the needs of network monitoring carried out network monitoring needs [19].

Table 1. Monitoring Server *VM* Specifications

No	Device Name	Amount
1	*Memory*	701
2	*Processor*	649
3	*Ethernet Card*	648
4	*Harddisk*	

The next stage is Design. At this stage, the simple design that has been made will be redesigned using a topology design application, so that the topology picture can be explained in detail to the user. Topology Design application, so that the topology description can be explained in detail to the management. The network design that has been made must have reliability, security and good performance [20].
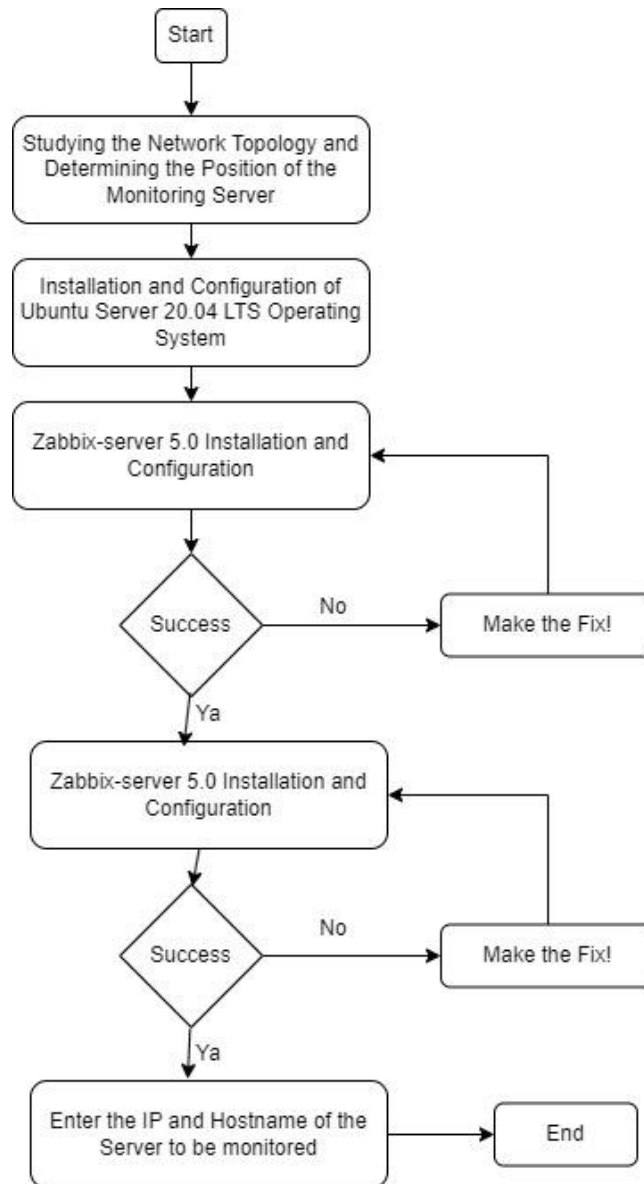

Figure 3. Zabbix Server Installation and Configuration Process

Figure 3 describes the process of installing and configuring Zabbix. The first step is done by studying the existing network topology at Diskominfo Bengkayang, which aims to determine the location of the monitoring server position. The next step is to install and configure the Ubuntu Server 20.04 LTS operating system as a server to run the web-based Zabbix system. When the Zabbix server installation and

configuration have been successfully carried out, the next process is to check and repair if there is a failure in the system that has been installed. After going through the checking process, the next step is to input the IP address along with the hostname of the server that will be monitored [21].

The next stage is Implement, which is the phase where all the results of the analysis that have been planned and designed will be implemented. The results of this stage will determine how much the system created and planned is by the results achieved and determine whether the system built is successful or not. The results achieved determine whether the system built succeeds or fails [22].

The next stage is operation. In this stage, testing of the running system is carried out. Testing is carried out to test whether the system can monitor in real-time or is not able to provide detailed information able to provide detailed information [23].

The next stage is Maintenance. The system that has been created will certainly be maintained on a certain time scale, to keep the system working optimally and to see if the performance of the system is by the requirements work optimally and see the performance of the system is by the results achieved or not with the results achieved or not. System maintenance is carried out by several parameters, namely: network speed, response time, memory usage, and system usage efficiency memory usage, and system usage efficiency [24].

The following are the main challenges in implementing network server system maintenance using Zabbix on SNMP and network data analysis at Diskominfo Bengkayang in 2024, among others:

Table 2. The implementation of network server system maintenance

No	Implementation of network server system maintenance	Description
1	Complex Network Configuration	Configuring SNMP across various devices can be difficult, especially regarding version compatibility and security settings
2	Scalability and Performance	Ensuring Zabbix handles large data volumes efficiently without delays or missed alerts
3	Data Analytics	Making sure the collected data is actionable and offers useful insights
4	Maintenance and Recovery	While virtualization simplifies recovery, ensuring continuous monitoring during recovery remains a challenge

The sixth phase is optimization, which is the phase of identifying and solving problems. Solve the problem, if too many problems arise then return to the the beginning of the cycle on PPDIOO [10].

RESULTS AND DISCUSSION

If the system configuration has been successfully carried out, the next process is to test the monitoring system that has been created. Is to test the monitoring system that has been made. In the testing phase, it is tested how many items are successfully monitored and the parameters monitored are checked. This test is done by seeing how much the system can read network traffic from routers that provide data information to Zabbix. The results obtained by SNMP from proxy forward monitoring data information to Zabbix and see the communication from the SNMP protocol to the Zabbix monitoring system can run. This system test is seen from several images that have been added as follows.

Figure 4. Adding an IP Address

Figure 4 shows the process of adding an IP Address from a proxy to be recognized by the SNMP protocol. The Server IP added is "192.168.229.222" on interface ether 1. Furthermore, after being successfully added, the Server IP is automatically read by the Zabbix system. The step continues with the SNMP setting in Winbox Mikrotik. Before configuring SNMP, SNMP needs to be enabled first to activate the SNMP function on the proxy. Configuration is carried out so that later the Zabbix system can communicate to get all the information needed by the Zabbix server from the proxy device.
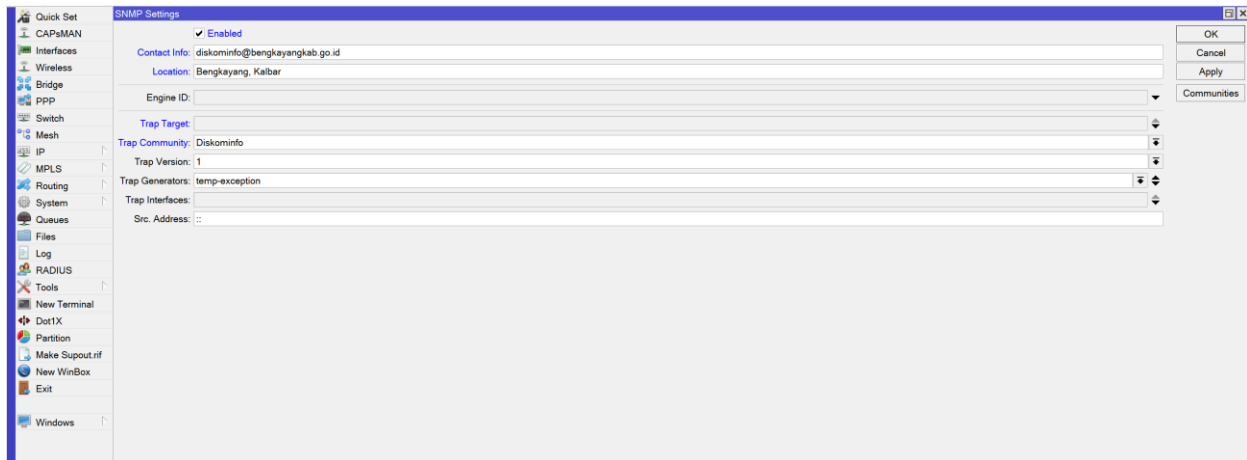

Figure 5. SNMP Setting

Figure 5 explains the SNMP setting process, namely by activating the SNMP function on the proxy, and then providing contact info and location according to the place created by the Administrator. Furthermore is done by creating an SNMP Community by adding the name SNMP name and adding the server IP address 192.168.229.222, security private by making the access read and write. In addition, Authentication Protocol is made into MD5 and encryption is made into AES. Figure 6 shows the process of adding the SNMP IP Address.

Figure 6. Adding an SNMP IP Address

If the SNMP protocol can be recognized by the Zabbix system, it is configured directly in Zabbix by adding the IP Address that was previously configured on the proxy.

Figure 7. Adding an SNMP to Zabbix

By monitoring the server by going to the browser page https://192.229.222/zabbix.The first thing to do by log in using the account that was created in the configuration process in the Ubuntu server, then log in with the username and password that has been created. The network administrator can monitor or see how many internet data packages are used and how many packages are available to meet

user needs, as well as see how many triggers the user needs, as well as see how many triggers, errors, and hardware components are experiencing problems with network components that are experiencing problems.

The initial stage in accessing Zabbix is by entering the server IP that has been previously configured using a web browser. Figure 8 is the login view of Zabbix using the user that has been created and configured previously, namely Username: Admin and Password: Zabbix. After successfully logging in, then proceed to the initial display page / dashboard of the monitoring system that has been previously configured.
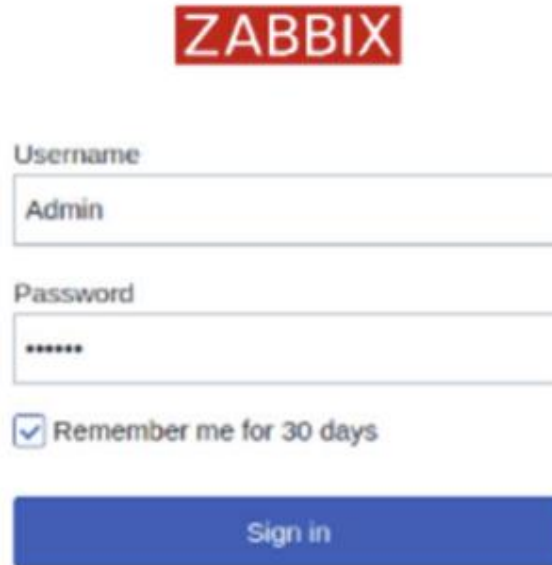

Figure 8. Zabbix Login Page

Figure 9 is the dashboard of the network monitoring system. The dashboard is the initial display of Zabbix monitoring. Many parameter items show what is being monitored starting from Network Traffic, Memory Utilization, Problems, Disk Read or Write Rates, CPU Utilization, Reporting Process, and System Information. With this detailed monitoring system with this detailed monitoring system, a network administrator can see all monitored items in full complete detailed, and displayed in real-time.

The first test is done by detecting problems or troubleshooting that occur in the Zabbix system. With this test network monitoring using Zabbix can run or not. Figure 10 is the result obtained in the Detect Problem test.
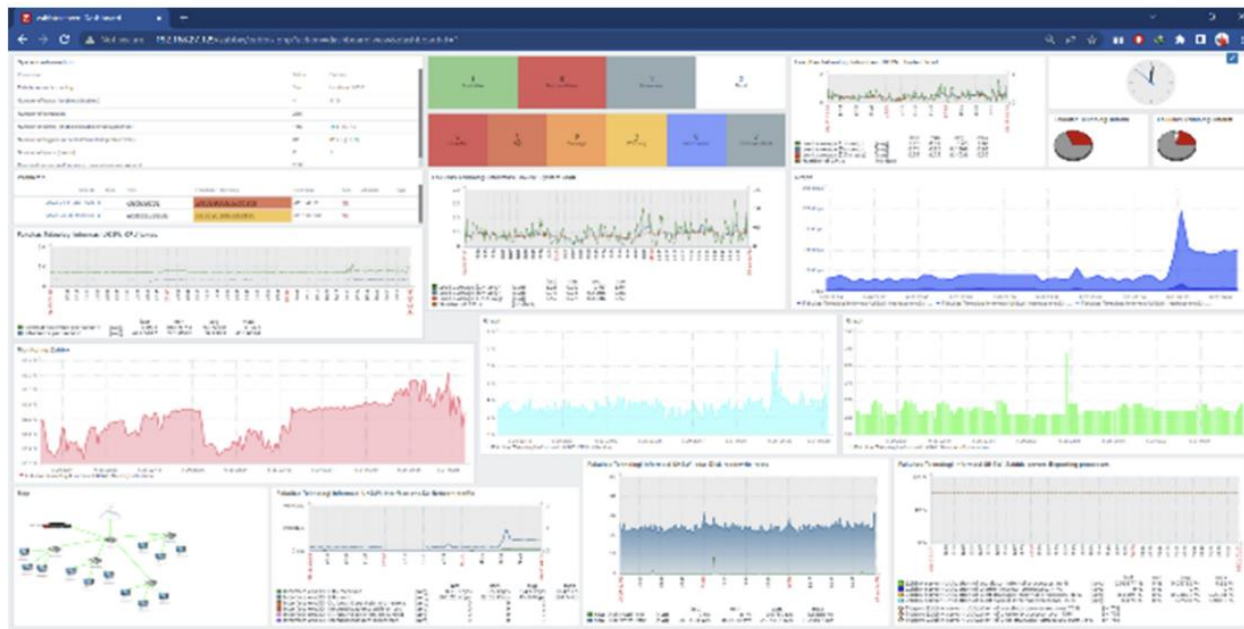
Figure 9. Network Monitoring System Dashboard

Figure 10 conveys information about problems that arise against the monitoring system based on the monitored time. Problem detection detection is one of the most important things because network administrators can check for network troubleshooting early on the network the occurrence of network problems is raised by the Zabbix system in the detect problem, interrupts per second.

CONCLUSION

From the results of the research, implementation activities have been successfully carried out network monitoring using snmp-based zabbix using zabbixserver 5.0. This research concludes that it can be shown how the zabbix system works to monitor and maintain the server network at diskominfo bengkayang. Monitoring can be done by viewing and monitoring at any time running. Network administrators can access internet data data that is monitored easily. Monitoring results include how many numbers of internet packets are spread and used, how much memory is used for monitoring, the amount of storage or hard disk capacity used to perform monitoring, the amount of storage or disk capacity used, as well as providing reports on network problems that are in trouble. Used, as well as providing reports on network problems that are in trouble. Therefore, network administrators can be helped in checking and monitoring the network. And network monitoring. Future research is expected to facilitate and conduct trials on other network hardware devices and develop more by simplifying and develop more by simplifying the process of placing installed hardware and configurations. Hardware installed and network system configurations to reach better internet quality reach better internet quality.

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