

# Analysis of Determining the Types of Wireless BTS Devices Using the Dude Implementation and Telegram Notifications on Internet Services Provider XYZ

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Robertus Saptoto<sup>1,2\*</sup>, Bambang Purnomosidi DP<sup>3†</sup>, Widyastuti Andriyani<sup>3‡</sup>, and Rikie Kartadie<sup>3§</sup>

1 Student, Master in Information Technology Universitas Teknologi Digital Indonesia, Yogyakarta, Indonesia

2 Sekolah Tinggi Pariwisata AMPTA Yogyakarta, Indonesia

3 Master in Information Technology Universitas Teknologi Digital Indonesia, Yogyakarta, Indonesia

\* *E-mail: robertus.saptoto@gmail.com*

† *E-mail: bpdp@utdi.ac.id*

‡ *E-mail: widya@utdi.ac.id*

§ *E-mail: rikie@utdi.ac.id*

**Abstract:** ISP XYZ is a company engaged in the field of Internet Service Providers (ISP). Network monitoring is something that an ISP must have in monitoring network router traffic, wireless Base Transceiver Station (BTS) traffic and wireless client traffic. Connections between BTS backbone and BTS use wireless devices. Because currently the main network (backbone) inter BTS to BTS uses wireless devices, sometimes disturbances occur such as frequency interference and high data loads on BTS which lead data distribution to customers disrupted. The factors that affect this incident are the number of similar frequency number usage, the distance between BTS to BTS, the type of wireless device that can no longer carry large data loads as its main source. Telegram makes it possible to send and receive text messages over the internet. This research will be used to determine policies for updating wireless devices, especially on the BTS to BTS backbone. Chat, video calls, shared photos and files, telegram supports bots. This bot will later be used to mechanize notifications from the dude application to telegram messages, which of course are connected to the internet. You can provide reports on the use of data traffic, wireless device data resources that are currently implemented.

**Keywords:** The Dude, Bot Telegram, ISP, BTS

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## 1. Introduction

Internet Service Provider XYZ is a company engaged in Internet Service Providers (ISP) since 2010. The services available at this ISP are Air 1 with a bandwidth up to 6 Mbps, Air 2 with a bandwidth up to 9 Mbps and Air 3 up to 19 Mbps. This ISP in the distribution of data between the Base Transceiver Station (BTS) and the client remains using wireless devices. Engaged in internet services, ISP XYZ is committed to providing excellent service to its customers by providing reliable, stable and fast internet services. To get a reliable, stable and fast service, it is necessary to have a capable wireless device in accordance with the needs of distributed traffic data. Currently, the main network (backbone) between BTS to BTS utilizes wireless devices. Sometimes, disturbances occur such as frequency interference and high data loads on

BTS which cause data distribution to customers disrupted. Factors that affect this occurrence are the number of the same frequency number usage, the distance between BTS to BTS, the type of wireless device that can no longer bear large data loads as its main source. The Dude is an application that is quite reliable in monitoring network systems [1]. The Dude has the ability to be able to display running traffic data, router resources and provide notifications if there are something wrong with the devices [2]. To ease in monitoring the network when the network administrator is not available in the office and keep getting the notifications when the device has problems, additional applications are needed. This app uses telegram bot. Telegram makes it possible to send and receive text messages over the internet. In addition to the functions of Telegram, apart from being able to use chat, video calls, shared photos and files, Telegram also supports bots [3]. This bot will later be utilized to provide notification automatically from the dude application to telegram messages which of course are connected to the internet [4]. By the dude application and the telegram bot, it is expected to provide reports on the use of data traffic, wireless device data resources that are currently implemented [5].

## 2. Research Methodology

### 2.1. Data Collection Method

Data collection methods used in this study are:

1. Interview Method. This method aims to obtain information verbally by the network administrator regarding the network that is currently running.
2. Observation Method. This method is done by making direct observations related to running applications and observing what obstacles are faced by network administrators.
3. Literature Review Method. This method is carried out by collecting and studying a num-

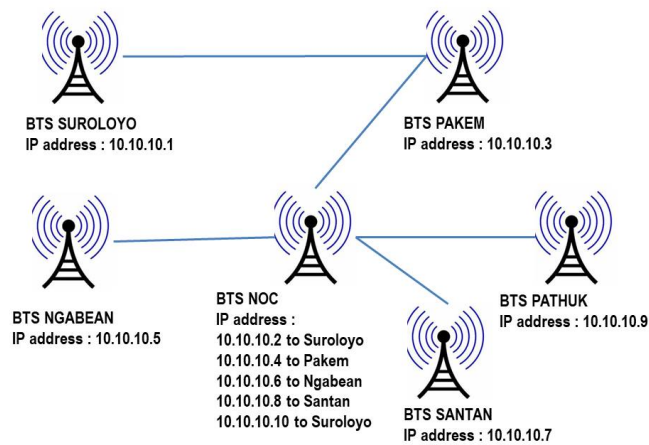
ber of literature studies from journals and websites related to this research analyst [6].

## 2.2. Network Design Method

This network design method aims to facilitate for network administrators to find out the layout of network components [7]. The components in utilizing network design as follows :

### Network Design Architecture

The network design architecture at the XYZ ISP provider is currently running, which can be seen in Figure 1

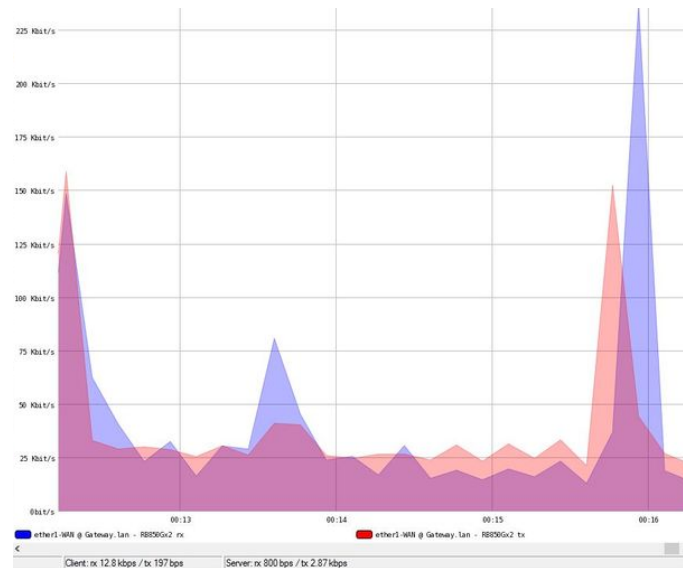


**Figure 1.** Network Architecture BTS ISP XYZ

In this designed network architecture, 5 wireless devices are applied at Suroloyo BTS, Pakem BTS, Ngabean BTS, Santan BTS and Pathuk BTS. Meanwhile, there are 5 wireless devices in BTS NOC. This wireless device uses a 5.8 Ghz antenna which allows data traffic to run properly. The frequency of each BTS usage from one BTS to another must be different to avoid frequency interference [8]. Frequency interference can cause in large data ping latency so the distribution to customers is disrupted [9].

C. The Dude Network Monitoring Design The logging feature is one of the features in

Mikrotik which is practical in recording various activities from the system and router status information. The purpose of this logging setting is so that the activities recorded in the log can be accepted by The Dude as a syslog service. The rules in the logging system aim to record services in the log. Network monitoring is using The Dude application [10]. This application is expected to present the reports on the data traffic results which is running on the XYZ Internet Services Provider network. This data will be seen in Figure 2.



**Figure 2.** Running Graph Traffic Result

### 2.3. API Telegram Bot

Telegram API bot is an Telegram Messenger. It is a free messaging application with a focus on speed and security and has a variety of appealing features. Telegram Messenger can not only be used as a communication medium between Telegram Messenger users, but also can be used to communicate from the machine to Telegram application users by utilizing the Telegram Bot API feature [11].

## 2.4. SNMP

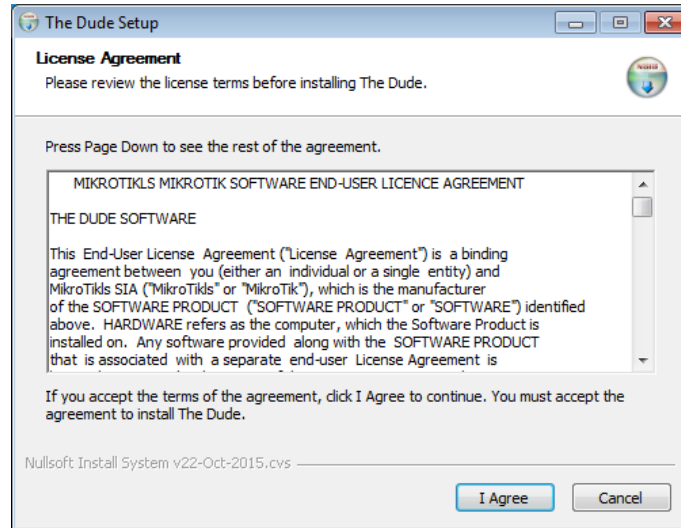
Simple Network Management Protocol (SNMP) is a protocol designed to provide users with the ability to monitor and manage computer networks distantly or remotely [12]. SNMP consists of Network Management System (NMS) and SNMP Agent [13]. The SNMP function is to graph various data with tools such as CACTI, MRTG or The Dude [14]. SNMP also provides a way to collect information, control, manipulate, configure and exchange information between devices on a network. This will help to monitor, audit, detect faults in the network and configure remote devices in real-time [15]. Utilizing this protocol, monitoring will be more efficient in traffic management.

## 3. Findings and Discussions

The following are the findings and discussion of this research as follows:

### 3.1. The Dude Instalation

Before implementing the research, it is necessary to prepare the installation before employing The Dude application. The researcher applied The Dude version 6.47.8. The template used is the default from The Dude from Mikrotik. Installing The Dude is similar as installing any other software. Therefore, to do settings on The Dude server, it can be seen in the following way:



**Figure 3. The Dude License Agreement Installation**

There are parts or components when configuring The Dude application. The components which should be taken notice are :

1. Server : Fill with Public IP or local IP on the server network
2. Port : 8291 is the standard port from The Dude application
3. Username : Fill with the user router server
4. Password : Fill with the user server password

After the data is filled in, select the connection so that The Dude application is connected to the server as shown in Figure 4.

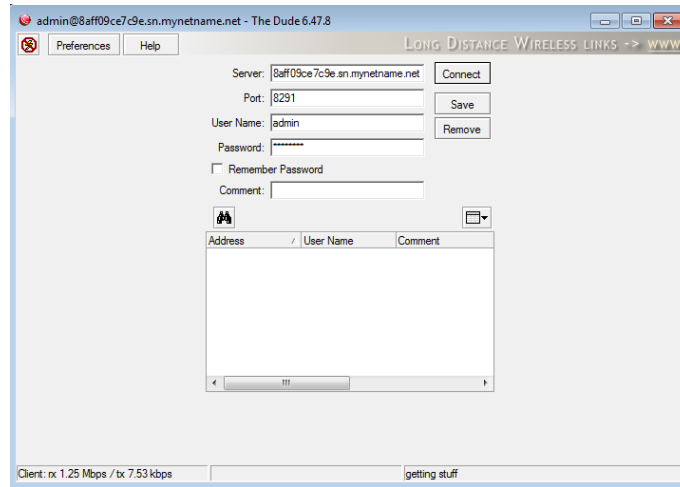


Figure 4. Initial Setup the Dude Application

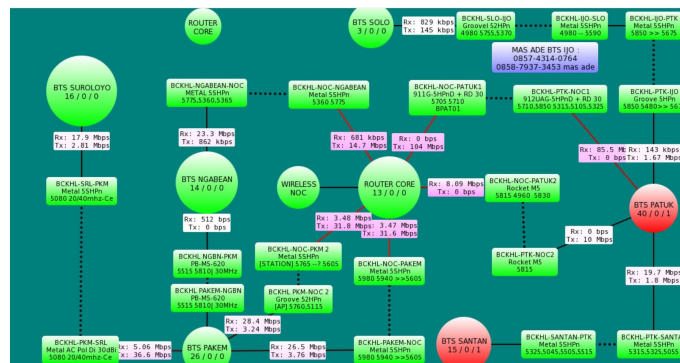


Figure 5. Client - BTS - NOC Connection figure with The Dude

In Figure 5 explains the network that has been connected from the client - BTS - NOC. In addition to elaborate the traffic data in the dude's implementation, there have already been types of devices used on each Base Transceiver Station (BTS).

### 3.2. Bot Telegram

The configuration of the telegram bot on the dude application allows configuration to get notifications. This configuration requires an API Token to integrate the dude and telegram messenger by entering the following program code:



```
/tool fetch  
url="https://api.telegram.org/bot1179128865:AAEvrEEGULC4d6pSMJNSvrAMxzxcXugiEs/  
sendMessage?chat_id=-496301795&text=[TimeAndDate] Service[Probe.Name] pada  
[Device.Name] Ip Address [Device.FirstAddress] sekarang [Service.Status]"  
keep-result=no
```

The description on code script Token API Telegram as follows :

**/tool fetch url** : get the notification which will be sent using port http API Bot Telegram

**&text** : fill the message which will be sent

**[TimeAndDate]** : show the time when the notification occurred

**[Probe.Name]** : the service presented in the sent message

**[Device.Name]** : device name which will be sent through the device notification

**[Service.Status]** : show the device status in up or down condition

This notification will appear in a telegram message by displaying all the data that has been created. The results of the notification are in Figure 6 below.

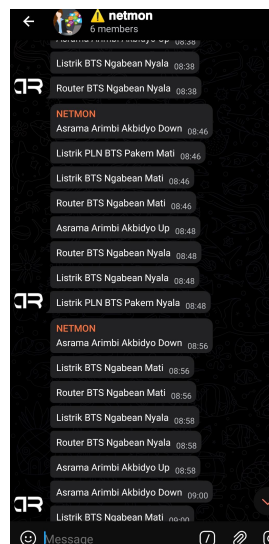


Figure 6. Telegram Notification Image

### 3.3. Analysis

From the monitoring data using the dude application, it is found that running traffic can be monitored by generating the following data on Table 1:

**Table 1. Monitoring Result**

MONITORING RESULT			
No	BTS Name	Bandwidth	Ping
1	BTS NOC to BTS Pathuk 1	104 Mbps	2 digit
2	BTS NOC to BTS Pathuk 2	8,9 Mbps	1 digit
3	BTS NOC to BTS Pakem 1	31,8 Mbps	1 digit
4	BTS NOC to BTS Pakem 2	31,6 Mbps	1 digit
5	BTS NOC to BTS Ngabean	14,7 Mbps	1 digit
6	BTS Pakem to BTS Surolooto	36,6 Mbps	1 digit
7	BTS NOC to BTS Santan	19,7 Mbps	1 digit

The table above illustrates that the largest traffic is on BTS Pathuk 1 which carries data load of internet traffic data up to 104 Mbps with a ping latency of 23millisecond. The ability of the current device is still sufficient to distribute data to customers. Thus the BTS NOC to BTS Pathuk 1 device that uses the BTS NOC device specifications: Mikrotik RB 911G-5HPND and BTS Pathuk 1 uses the Rocket Disk device specification series 30 using the frequency 5705 can still provide good service to customers indicated by the ping parameter only 2 millisecond digits

## 4. CONCLUSION

Based on the results of the implementation of The Dude application and the implementation of the telegram bot, the parameters that can be concluded are as follows:

By using The Dude Monitoring application, the ongoing network can be monitored properly.

This application can illustrate the amount of data capacity and bandwidth that runs from Base

Transceiver Stations (BTS). The largest traffic capacity and bandwidth is in BTS Pathuk 1 with data up to 104 Mbps.

Using telegram bots will ease the network administrators to monitor data traffic on the network. The use of wireless device specifications which are currently used applying the type of device Mikrotik RB 911G-5HPND and BTS Pathuk 1 applying the Rocket Disk 30 series device specifications can still supply consumers well.

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