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Netvista Public Wireless Network Quality Analysis Using Quality Of Service Parameters

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ABSTRACT

The use of public wireless networks is increasingly used by the public because it is able to touch all walks of life using the internet because of its affordable prices. Apart from the affordable price, the ease of accessing this network so that many people prefer to take advantage of public wifi. However, with the increasing number of network users, of course, it will affect the quality of the network. Based on these problems, the researcher decided to conduct a study to analyze the quality of the public wireless network from NETVISTA. The NETVISTA public wireless network can be accessed in Kangenan Gg. 1, so the researcher decided to conduct research at the location for 2 days. This study aims to determine the quality of the internet connection network based on *QoS* parameters by knowing the *delay, throughput*, and *packet loss* obtained from *the axence nettols* application which will later be compared with the TYPHON standard so that the quality of the NETVISTA public wireless network can be known. The method used in this study is descriptive analysis. From this study, the results were obtained that many users (category: "Busy") the quality of Netvista's public wireless network was less satisfactory or at point 2.6, while when there were few users (category: "Not Busy") the quality of Netvista's wireless network was satisfactory or at point 3.1. The best time on holidays is between 11.00-12.00 and 22.01-00.00, while the best time on active days is 04.01-10.59 and 12.01-16.00.

INTRODUCTION

Technology is developing rapidly day by day and has touched all fields of technology such as education, information, industry, communication, health, and business. Of course, in meeting the needs of technology, the internet has a considerable contribution so that its use requires quite good access (Oviliani Yuliana, 2000). The internet has several types of networks such as Local Area Network (LAN), Metropolitan Area Network (MAN), Wide Area Network (WAN), and Wireless Network or often called WiFi (Wongkar et al., 2015)(Prihanto, 2008). Of the several types of internet networks, the use of WiFi is the most often in demand because WiFi is generally used for the public or public domain so that people can easily access it (Bruse, 2015). Based on the results of the APJII (Indonesian Internet Service Providers Association) survey, it is stated that internet network users reach 221,563,479 out of 278,696,200 or equivalent to 79% of Indonesian people using the internet, of which Post Gen Z or called Gen Alpha 9.17%, Gen Z 34.40%, millennials 30.62%, Gen X 18.89%, baby boomers 6.58%, and pre boomers 0.24% (APJII, 2024). And WiFi users increased from the previous 20.80% in 2023 to 22.40% in 2024 (N, 2024). With many WiFi users, of course, it will affect the quality of the internet network. If the quality of the internet network is poor, of course, it will greatly affect the routine that requires the use of the internet (Bobanto et al., 2015). In today's world with the existence of technology that continues to develop in almost all fields, in fact, it is almost not spared from the use of the internet so that the quality of the network from the internet has a great influence on its users and can even cause considerable losses (Akbar & Noviani, 2019; Wardiana, 2002).

Based on research conducted by Westi Yulia Pusvita and Yasdinul Huda entitled "Analysis of Internet Network Service Quality Wifi.Id Using Qos (Quality Of Service) Parameters" states that internet quality is very influential on the location and number of users and it can be concluded that there needs to be consideration of access points so that users can access the internet optimally (Artawan et al., 2021). One of the considerations for the placement of acces points is the number of users in the area where the acces point is located (Pusvita & Huda, 2019). Meanwhile, from the research of Bobanto, et al. The one entitled "Analysis of Internet Network Service Quality (Case Study of PT. Kawanua Internetindo Manado)" states that the density of internet users or the use of the internet at the same time is the cause of poor internet quality because the distribution of connections is not optimal depending on the device used so that the internet connection in some people is of poor quality (Bobanto, William S., Lumenta, Aries S. M., 2014). And in the results of Erick Irawadi's research entitled "Analysis of Wifi Signal Quality at Indonesian Muslim University" stated that internet access time affects the quality of the internet network where access time is related to the number of internet users so that it can be known at a certain time that the number of internet users exceeds capacity and makes the quality

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of the internet network deteriorate. If it is concluded from the three studies, it can be seen that the number of internet network users greatly affects the quality of the internet network, so it is important to know the acces point, the number of users and the right time to get the best internet network quality (Alwi, 2019).

One example is what happened in Kangenan Village, Pamekasan, where there are several people who have a home business that uses the internet network which will later be used to promote goods as well as a means of connecting with buyers. In addition to entrepreneurship, the internet is also very much needed for young people who are still in school or college because assignments and face-to-face school are done online (Kristiyanti, 2010; Yuliana, 2000). And other users are residents who need important information or use communication means to contact relatives who live in different areas. So that the internet network has a great contribution to the residents in Kangenan Village.

Based on the above background, the researcher decided to conduct an analysis of the quality of the public wireless network connection which can later be a benchmark for readers regarding when is the right time to use the internet with good quality. To determine the quality of the internet network by measuring *delay*, *throughput*, and *packet loss* which will later be compared with the TYPHON standard (Nakulo et al., n.d.; Utami, 2020a). From the results of the analysis, it will also be known what factors worsen the quality of the network so that in the future improvements can be made to the quality of the internet network.

LITERATURE REVIEW

Computer Networks and the Internet

We can know computer networks as a connecting infrastructure that allows one device to share data with each other (Astuti, 2018)(Putra, Baidawi, et al., 2023). Meanwhile, the internet network itself is a human-engineered system to connect devices globally so that it can connect with millions of computers around the world (Prasetyo & Putra, 2024). The existence of both networks is very important because it makes it easier for humans to be able to transfer data without having to spend funds for data transmission (Putra, Riski, et al., 2023). Of course, networking is also a form of technological development and can make work easier (Hari et al., 2023; Putra, Putra, et al., 2023). With the existence of the internet, we can not only transfer data but also access application services that have many functions such as means of communication (social media: facebook, instagram, whatsapp, telegram, etc.), means of information (google, firefox, internet explorer, etc.), and means of entertainment (games, youtube, netflix, etc.) (Rohall, 2005; Rohaya, 2008). Thus, the existence of the internet has become an important thing in all aspects of human life. Even contacting distant relatives and conducting meetings with clients remotely is no longer an obstacle. The existence of technology that continues to develop rapidly has a huge influence on the development of the world (Machmud, 2011).

WiFi

WiFi is no stranger to the general public (Zhong et al., 2015). We can know, Wireless Fidelity or often called WiFi is a wireless technology that uses sound waves as a means to connect several devices so that they can send data to each other or it can be said that WiFi is a technology that accommodates the internet (Edavos, 2024). In this digital era, WiFi is at the top of the world because it functions as the backbone of global connectivity which is the most widely used today because it is easy to use and is not disturbed by the presence of cables (Duarte et al., 2013; Hu et al., 2009). The distance that can be reached is very wide, it can reach more than 10 meters depending on the type of network used. WiFi can connect smart homes with various devices that have features that connect with WiFi or have WiFi access(REPEATER & SUDRAJAT, n.d.). Until now, WiFi is very popular and used by the general public because of the ease of installation and use of access, so it is in great demand, both in the realm of cafes, offices, schools, hospitals, and even companies.

Netvista

Similar to Wifi.id, Netvista is also a public wireless network that utilizes WiFi in its use to access the internet. Netvista is a public wireless network provided by internet service providers that can later be used by purchasing vouchers from service providers (Fatoni, 2022). For the spread of access, netvista is still very new among internet service providers so it has a small coverage. To be able to access the internet network, of course, we have to buy a voucher code from the service provider at the lowest price of Rp. 2000,- for a day, Rp. 5000,- for three days, Rp. 15000,- for ten days, and Rp. 40000,- for one month. Of course, after we buy the voucher, we can access the internet provided freely until the specified time. With the price as mentioned earlier, it is a point for people to use Netvista in the midst of the price of data packages that continue to be expensive.

Typhon

Telecommunications and Internet Protocol Harmonization Over Network or known as TYPHON is a standard for measuring the quality of internet networks with the parameter Quality of Service or called QoS (Utami, 2020b). TYPHON was initiated by the European Telecommunications Standards Institute called ETSI. We can find out the quality of the network transmission with the TYPHON standard from the table below (ETSI, 2020):

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Table 1. Overall Transmission Quality Rating for TIPHON Systems

TIPHON QoS Class	4 (Best)	3 (High)	2 (Medium)	1 (Low)
Overall Transmission Quality Rating	> 90	80-89	70-79	60-69
User's satisfaction (from ITU-T)	Very satisfied	Satisfied	Some users dissatisfied	Many users dissatisfied

NOTE 1: The values given in the row 'Overall transmission quality rating' are provisional.
NOTE 2: The descriptions in this table include the effects of packet loss.

The quality of the end to end network is greatly influenced by how compatible the terminal and network are, so the TYPHON terminal needs to be adjusted to its characteristics so that it can interact and comply with TYPHON standards. The reason for this is due to the wide spread in network characteristics that there are three different classes of terminals defined to match a range of characteristics of a particular IP network. The table below explains the relationship between the terminal class and the characteristics of the network designed in accordance with the terminal and end-to-end performance objectives (ETSI, 2020).

Table 2. Relationship between Terminal Class and Achievable System Performance

Terminal Class	Network Characteristics	Performance Objective achievable for terminal - network combination
Class A	High bandwidth, e.g. Intranets based on LANS	High-Best
Class B	Medium bandwidth (< 64 kbit/s), e.g. Intranets with rather limited capacity or connection to the Internet via ISDN	Medium - High
Class C	Low bandwidth (< 25 kbit/s) e.g. connections to the Internet via a modem link	Best effort - Medium

Quality of Service (QoS)

Quality of Service is a technology service that manages data traffic by looking for packet loss, jitter and latency which will later be useful for finding solutions to improve the quality of the internet network (Binus, 2020; Calinescu et al., 2010). QoS manages network sources by assigning priority to specific data types in the network. QoS is designed to help end users be more productive by relying on reliable performance from network-based applications. The purpose of the QoS parameter is to meet the level of need for network management services by utilizing the same infrastructure (Bobanto, William S., Lumenta, Aries S. M., 2014). So that QoS provides offers to define the attributes of network services owned quantitatively and qualitatively. The ultimate goal of QoS is to create good and planned network quality by ensuring controlled network management so that the network performance criteria are in accordance with the level of user satisfaction with the service (Kamarullah & Hafiz, n.d.). For many users, QoS is very important because it includes a data traffic management service that guarantees a level of performance. QoS parameters certainly have parts, such as *throughput, packet loss, delay, and Jitter* (Binus, 2020)(Lee et al., 2013).

a. Throughput

Throughput is the capacity of the actual data transfer process path that is measured over a certain measure of time in the transmission of data/files. The unit of calculation of throughput is bits per second or called bps (Utami, 2020b). Throughput is similar to bandwidth but different because it focuses on the actual time and under certain network conditions to download files of a certain size. The method of calculating throughput is the amount of incoming data observed in a certain period of time divided by a certain time interval (Binus, 2020).

Table 3. TYPHON Standard on Throughput

Category Throughput	Throughput (bps)	Index
Very Good	100	4
Good	75	3
Medium	50	2
Bad	<25	1

Throughput calculation equation :

$$\text{Throughput} = \frac{\text{Data packet received}}{\text{Observation Period}}$$

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b. Packet Loss

Packet loss is a parameter that shows the percentage of conditions of many packets lost during the data transition period that occurs due to collisions and congestion in the network (Borella et al., 1998). Collision and congestion in this network are influenced by many factors such as problems in network devices, decreased network signal strength, or it can also be due to ambient radiation (Utami, 2020b). The occurrence of packet loss greatly affects network efficiency even though the amount of available bandwidth is sufficient to access data (Binus, 2020).

Table 4. TYPHON Standard on Packet Loss

Category Degredation	Packet Loss (%)	Index
Very Good	0	4
Good	3	3
Medium	15	2
Bad	25	1

Packet Loss calculation equation :

$$\text{Packet loss} = \frac{(\text{Data packet sent} - \text{Data packet received}) \times 100\%}{\text{Data packet sent}}$$

c. Delay

Delay is the amount of time used by data during the transmission process where during the journey of sending data experiences obstacles so that it uses other lanes that are taken for a longer time than actually (Fatoni, 2022). Delays can occur due to the very long distance traveled, or due to the hardware condition of the device used or intended for use, or because of taking another route to send data to avoid congestion in routing (Utami, 2020b). Delay calculation can be obtained from dividing the packet length (bits) by the bandwidth link (bit/s) (Binus, 2020).

Table 5. TYPHON Standard on Delay

Category Delay	Large Latency (ms)	Index
Very Good	<150 ms	4
Good	150 ms s/d 300 ms	3
Medium	300 ms s/d 450 ms	2
Bad	> 450 ms	1

Delay calculation equation:

$$\text{Average Delay} = \frac{\text{Total Delay}}{\text{Total Packets Received}}$$

Axence Nettols

Axence NetTools is an application device that is practically used to scan, observe, secure, manage and analyze internet networks (Raharjo & Danaryani, 2018). In the application, Axence NetTools has several sections such as Netwatch (Observation of the network and its flow in real time), while Netstats (informing about the entry and exit of connections and opening ports), and other sections measure network performance, scan nodes or obstacles, check DNS, and more. Axence NetTools is a complete application and is highly recommended for home or commercial use. To download the Axence NetTools application can be done on the Axence web (Axence, 2005).

METHOD

Place and Time of Research

This research was conducted in Kangenan Village Gg.1, Pamekasan, East Java where the Netvista public wireless network is installed. The researcher conducted research from one point at several times, namely morning, afternoon, afternoon and night to find out the right time to use the Netvista internet network with good network quality. The research was carried out from June 23, 2024 at 06.00 WIB to June 24, 2024 at 06.00 WIB at 00.00.

Research Tools

The tool used by the researcher is an Asus X454Y laptop with Windows 10 86-bit OS specifications, Amd A8, 4 GB RAM, and 500 GB HDD. The software used is Axence NetTools 5.

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Research Diagram

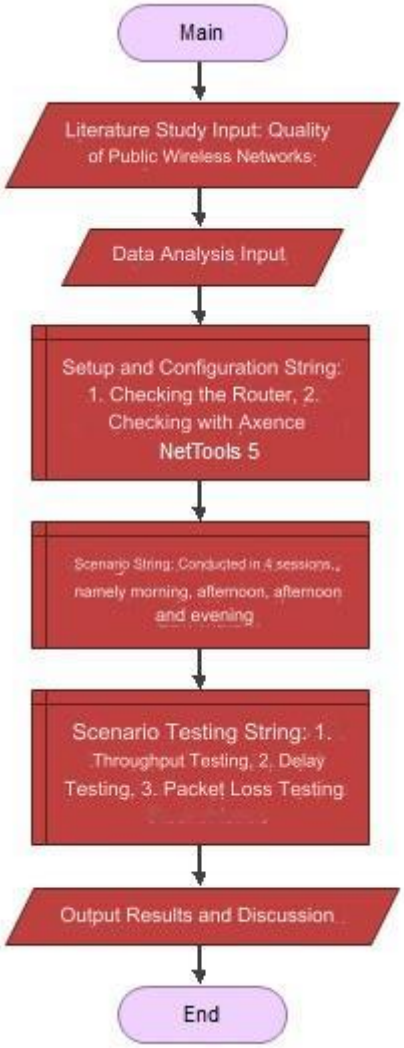


Figure 1. Research Order Chart

Research Methods

In this study, the researcher uses the action research method. There are 4 stages of the action research cycle as follows:

a. Conducting Diagnosis (Diagnosis)

In the first stage, of course, we will do data diagnosis/analysis. In the analysis process, the researcher identified problems or performance obstacles in the Netvista public wireless network in Kangenan Village, Gg. 1, which caused the delay in network quality based on QoS parameters.

b. Making an Action Plan (Action Planning)

In the next stage, namely the action plan, the researcher tried to understand the main problem which was then continued with the preparation of the right plan in testing the quality of the Netvista public wireless network with the QoS parameters of the TYPHON standard.

c. Action Taking

At the next stage, enter the towing section. Here, the researcher made a plan system with the aim of being able to solve network problems by testing the quality of the Netvista internet network with the QoS parameters of the TYPHON standard. In the mechanism, the researcher tried to use the Axence NetTools 5 software, namely to find out the value information needed to later compare with the TYPHON standard.

d. Evaluating

Until the final stage where the author is able to provide results and evaluation after the action stage. The author can write an evaluation of the network quality test results with the TYPHON standard QoS parameters on the Netvista Public wireless network to find out whether the internet network is included in the good or bad category.

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e. Scenario Analysis

The importance of data analysis in research is because data analysis is a point of proof of the results which will later be written in the final conclusion. We can see, the definition of Analysis is a prediction of research actions that will later become information about the answer to the problem-facing research. In this study, the data analysis research process was grouped according to the parameters needed, namely: *throughput, packet loss, and delay*.

RESULT

In this discussion, we have reached the research stage and the results are a form of implementation of the research plan that has been prepared by utilizing QoS parameters using Axence NetTools software on the Netvista public wireless network to get information about *throughput, delay, and packet loss*.

In the research process, it was carried out for 2 days from June 23, 2024 at 00.00 WIB to June 24, 2024 at 06.00 WIB at 00.00 which was carried out in Kangenan Village, Gg. 1. This research was carried out to find out when the effective time in using the network is to get good network quality.

Delay Measurement

In the *Delay* measurement, we can fill the table with several sections, namely, the date of the study, the time of the study, the two categories of time ("Busy (many users)" and "Not Busy (few users)"), and the delay value (min, max, average). From the *delay* measurement using Axence NetTools, the following results were obtained:

Table 6. Delay Results Table

Date	Time	Categories	Delay		
			Min	Max	Average
23 June 2024	04.01 – 07.00	Busy	30	978	52
	07.01 – 10.59	Not Busy	29	762	205
	11.00 – 12.00	Not Busy	29	368	34
	12.01 – 16.00	Busy	30	89	31
	16.01 – 22.00	Busy	29	89	31
	22.01 – 00.00	Not Busy	30	63	53
24 June 2024	00.01 – 04.00	Not Busy	29	721	201
	04.01 – 07.00	Busy	29	84	34
	07.01 – 10.59	Not Busy	29	678	43
	11.00 – 12.00	Not Busy	29	680	52
	12.01 – 16.00	Busy	23	868	89
	16.01 – 22.00	Busy	29	870	73
	22.01 – 04.00	Not Busy	29	67	31

Throughput Measurement

In the *Throughout* measurement, we can fill the table with several sections, namely, the date of the study, the time of the study, two categories of time (“Busy (many users)” and “Not Busy (few users)”), and the Throughput value (min, max, average). From the *throughput* measurement using Axence NetTools, the following results were obtained:

Table 7. Throughput Results Table

Date	Time	Categories	Throughput		
			Min	Max	Average
23 June 2024	04.01 – 07.00	Busy	511.528	2.309.064	1.322.378
	07.01 – 10.59	Not Busy	537.840	2.657.376	1.973.456
	11.00 – 12.00	Not Busy	1.444.544	2.328.328	1.758.411
	12.01 – 16.00	Busy	499.160	2.601.492	1.793.300
	16.01 – 22.00	Busy	482.672	2.592.921	2.011.233
	22.01 – 00.00	Not Busy	1.052.942	2.339.233	2.285.798
24 June 2024	00.01 – 04.00	Not Busy	1.422.324	2.322.328	2.176.223
	04.01 – 07.00	Busy	480.002	2.653.376	1.973.223
	07.01 – 10.59	Not Busy	537.835	2.632.170	2.137.422
	11.00 – 12.00	Not Busy	483.866	2.632.171	2.134.462
	12.01 – 16.00	Busy	944.732	2.91.452	2.244.571
	16.01 – 22.00	Busy	903.280	2.719.801	2.304.933
	22.01 – 04.00	Not Busy	872.503	2.822.776	2.167.902

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In the table above, the results of throughput measurements have been obtained. Furthermore, a network quality assessment is carried out by assessing throughput measurements based on the TYPHON standard in the form of a table called a throughput value recapitulation as follows:

Table 8. Throughput Recapitulation Table

Date	Time	Categories	Throughput		
			Value	%	TYPHON
23 June 2024	04.01 – 07.00	Busy	1.322.378	44	Ugly
	07.01 – 10.59	Not Busy	1.973.456	65.8	Keep
	11.00 – 12.00	Not Busy	1.758.411	59	Keep
	12.01 – 16.00	Busy	1.793.300	59.8	Keep
	16.01 – 22.00	Busy	2.011.233	50	Keep
	22.01 – 00.00	Not Busy	2.285.798	75.9	Very Good
24 June 2024	00.01 – 04.00	Not Busy	2.176.223	60	Keep
	04.01 – 07.00	Busy	1.973.223	65.8	Keep
	07.01 – 10.59	Not Busy	2.137.422	71	Keep
	11.00 – 12.00	Not Busy	2.134.462	71	Keep
	12.01 – 16.00	Busy	2.244.571	74	Keep
	16.01 – 22.00	Busy	2.304.933	57.6	Keep
	22.01 – 04.00	Not Busy	2.167.902	54	Keep

From the table above, we can conclude that the maximum throughput result is on June 24, 2024 at the time of pointing at 22.01 – 00.00 and the minimum throughput result is on June 24, 2024 at the time of pointing at 04.01 – 07.00

Packet Loss Measurement

In the *Packet Loss* measurement, we can fill the table with several sections, namely, the date of the study, the time of the study, the two categories of time ("Busy (many users)" and "Not Busy (few users)"), and the packet loss value (sent, lose, %lost). From the *delay* measurement using Axence NetTools, the following results were obtained:

Table 9. Packet Loss Results Table

Date	Time	Categories	Packet Loss		
			Sent	Loss	Lost (%)
23 June 2024	04.01 – 07.00	Busy	367	175	53
	07.01 – 10.59	Not Busy	269	0	0
	11.00 – 12.00	Not Busy	296	2	2
	12.01 – 16.00	Busy	341	106	32
	16.01 – 22.00	Busy	355	67	18
	22.01 – 00.00	Not Busy	284	1	0
24 June 2024	00.01 – 04.00	Not Busy	320	22	7
	04.01 – 07.00	Busy	397	154	14
	07.01 – 10.59	Not Busy	367	13	4
	11.00 – 12.00	Not Busy	377	98	27
	12.01 – 16.00	Busy	387	54	13
	16.01 – 22.00	Busy	314	49	16
	22.01 – 04.00	Not Busy	314	23	7

DISCUSSION

In this stage, the author will discuss in detail the results of measuring QoS parameters with the TYPHON standard to determine the quality of service on the Netvista public wireless network and find out the best time to access the internet.

Table 10. Assessment Table of Research Results in QoS Parameters

Date	Parameters	Busy			Not Busy		
		Time	Index	Catalog	Time	Index	Catalog
23 June 2024	Delay	04.01 – 07.00	4	Very Good	07.01 – 10.59	3	Good
		12.01 – 16.00	4	Very Good	11.00 – 12.00	4	Very Good
		16.01 – 22.00	4	Very Good	22.01 – 00.00	4	Very Good
	Throughput	04.01 – 07.00	1	Ugly	07.01 – 10.59	2	Medium
		12.01 – 16.00	2	Medium	11.00 – 12.00	2	Medium

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		16.01 – 22.00	2	Medium	22.01 – 00.00	4	Very Good
	Packet Loss	04.01 – 07.00	1	Ugly	07.01 – 10.59	4	Very Good
		12.01 – 16.00	1	Ugly	11.00 – 12.00	4	Very Good
		16.01 – 22.00	1	Ugly	22.01 – 00.00	4	Very Good
24	Delay	04.01 – 07.00	4	Very Good	00.01 – 04.00	3	Good
June		12.01 – 16.00	4	Very Good	07.01 – 10.59	4	Very Good
2024		16.01 – 22.00	4	Very Good	11.00 – 12.00	4	Very Good
					22.01 – 04.00	4	Very Good
	Throughput	04.01 – 07.00	2	Medium	00.01 – 04.00	2	Medium
		12.01 – 16.00	2	Medium	07.01 – 10.59	2	Medium
		16.01 – 22.00	2	Medium	11.00 – 12.00	2	Medium
					22.01 – 04.00	2	Medium
	Packet Loss	04.01 – 07.00	3	Good	00.01 – 04.00	3	Good
		12.01 – 16.00	3	Good	07.01 – 10.59	3	Good
		16.01 – 22.00	2	Medium	11.00 – 12.00	1	Ugly
					22.01 – 04.00	3	Good
Total Average		2.6		**Unsatisfactory**	3.1		**Satisfactory**

From the table above, we can see that when there are many users (category: "Busy") the quality of the Netvista public wireless network is not satisfactory or is at point 2.6, while when there are few users (category: "Not Busy") the quality of the Netvista wireless network is satisfactory or is at point 3.1. The best time on holidays is between 11.00-12.00 and 22.01-00.00, while the best time on active days is 04.01-10.59 and 12.01-16.00.

CONCLUSION

Based on the discussion and research results that have been presented above, it can be concluded that:

1. The number of users can affect the quality of Netvista's wireless network, as evidenced by the QoS results which state that the network quality when there are few users is more satisfactory than when there are many users.
2. Time greatly affects the quality of Netvista's wireless network, as evidenced by the results of delay, throughput, and packet loss that direct certain times with the category of "very good" because time is also continuous with the number of users.

SUGGESTION

Based on the conclusions that have been conveyed above, the suggestions that can be given are:

1. Use more than one software and more adequate device to get maximum results in determining network quality.
2. Netvista wireless network operators can consider the location of access points in order to provide better performance and more stability.

REFERENCES

Akbar, A., & Noviani, N. (2019). Tantangan dan solusi dalam perkembangan teknologi pendidikan di Indonesia. *Prosiding Seminar Nasional Program Pascasarjana Universitas Pgri Palembang*.

Alwi, E. I. (2019). Analisis Kualitas Sinyal Wifi Pada Universitas Muslim Indonesia. *INFORMAL: Informatics Journal*, *4*(1), 30. https://doi.org/10.19184/isj.v4i1.10153

APJII. (2024). *APJII Jumlah Pengguna Internet Indonesia Tembus 221 Juta Orang*. APJII. https://apjii.or.id/berita/d/apjii-jumlah-pengguna-internet-indonesia-tembus-221-juta-orang

Artawan, I. G. S., Santyadiputra, G. S., & Agustini, K. (2021). Optimasi Penataan Access Point Pada Jaringan Nirkabel Menggunakan Algoritma Simulated Annealing. *Jurnal Pendidikan Teknologi Dan Kejuruan*, *18*(1), 32–42.

Astuti, I. K. (2018). Fakultas Komputer INDAH KUSUMA ASTUTI Section 01. *Jaringan Komputer*, 8. https://id.scribd.com/document/503304719/jaringan-komputer

Axence. (2005). *Download Axence Tools*. Axence. https://axence.net/en/axence-nettools

Binus. (2020). *QoS (Quality of Services)*. Binus. https://online.binus.ac.id/computer-science/post/qos-quality-of-services

Bobanto, W. S., Lumenta, A. S. M., & Najoan, X. (2015). Analisis kualitas layanan jaringan internet (studi kasus PT. Kawanua Internetindo Manado). *Jurnal Teknik Elektro Dan Komputer*, *4*(1), 80–87.

Bobanto, William S. , Lumenta, Aries S. M., N. X. (2014). Analisis Kualitas Layanan Jaringan Internet (Studi Kasus PT. Kawanua Internetindo Manado). *E-Journal Teknik Elektro Dan Komputer (2014), ISSN: 2301-8402*, *4*(1), 80.

Borella, M. S., Swider, D., Uludag, S., & Brewster, G. B. (1998). Internet packet loss: Measurement and implications for end-to-end QoS. *Proceedings of the 1998 ICPP Workshop on Architectural and OS Support for Multimedia Applications Flexible Communication Systems. Wireless Networks and Mobile Computing (Cat. No. 98EX206)*,

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https://doi.org/10.47709/brilliance.v4i1.4388

3–12.
Bruse, E. (2015). *Internet of Things: Definition, applications and comparison of wifi-based communication protocols for implementation of an irrigation system*.
Calinescu, R., Grunske, L., Kwiatkowska, M., Mirandola, R., & Tamburrelli, G. (2010). Dynamic QoS management and optimization in service-based systems. *IEEE Transactions on Software Engineering*, *37*(3), 387–409.
Duarte, M., Sabharwal, A., Aggarwal, V., Jana, R., Ramakrishnan, K. K., Rice, C. W., & Shankaranarayanan, N. K. (2013). Design and characterization of a full-duplex multiantenna system for WiFi networks. *IEEE Transactions on Vehicular Technology*, *63*(3), 1160–1177.
Edavos. (2024). *Apa itu WiFi & Bagaimana Cara Kerjanya*. Edavos. https://edavos.com/wifi-adalah/
ETSI. (2020). Telecommunications and Internet Protocol Harmonization Over Networks (TIPHON); General aspects of Quality of Service (QoS). *Etsi Tr 101 329 V2.1.1*, *1*, 1–37.
Fatoni, F. (2022). ANALISIS KUALITAS LAYANAN JARINGAN INTRANET (STUDI KASUS UNIVERSITAS BINA DARMA. *ANALISIS KUALITAS LAYANAN JARINGAN INTRANET (STUDI KASUS UNIVERSITAS BINA DARMA)*.
Hari, N. H., Putra, F. P. E., Hasanah, U., & Sutarsih, S. R. (2023). Transformasi Jaringan Telekomunikasi dengan Teknologi 5G: Tantangan, Potensi, dan Implikasi. *Jurnal Informasi Dan Teknologi*, 146–150.
Hu, H., Myers, S., Colizza, V., & Vespignani, A. (2009). WiFi networks and malware epidemiology. *Proceedings of the National Academy of Sciences*, *106*(5), 1318–1323.
Kamarullah, & Hafiz, A. (n.d.). Penerapan Metode Quality of Service pada Jaringan yang Padat. *Jurnal Jaringan Computer Unversitas Sriwijaya*.
Kristiyanti, M. (2010). Internet Sebagai Media Pembelajaran Yang Efektif. *Majalah Ilmiah INFORMATIKA*, *1*(1).
Lee, S., Kim, H., Hong, D., & Ju, H. (2013). Correlation analysis of MQTT loss and delay according to QoS level. *The International Conference on Information Networking 2013 (ICOIN)*, 714–717.
Machmud, M. (2011). Perkembangan teknologi dalam industri media. *Jurnal Teknik Industri*, *12*(1), 57–64.
N, Bestari. (2024). *Warga RI Rela Bayar Segini Langganan Internet, Murah atau Mahal?* CNBCIndonesia. https://www.cnbcindonesia.com/tech/20240131132212-37-510487/warga-ri-rela-bayar-segini-langganan-internet-murah-atau-mahal
Nakulo, B., Setiawan, C. B., Sahtyawan, R., & Al Badawi, M. A. A. (n.d.). *Analisis Quality of Service (QOS) pada Akses Game Online Menggunakan Standar Tiphon*.
Oviliani Yuliana. (2000). Penggunaan Teknologi Internet Dalam Bisnis. *Jurnal Akuntansi Dan Keuangan*, *2*(1), 36–52. http://puslit2.petra.ac.id/ejournal/index.php/aku/article/view/15666
Prasetyo, F., & Putra, E. (2024). *Jaringan Komputer Untuk Pemula* (Issue June 2023).
Prihanto, H. (2008). Membangun Jaringan Komputer. *Pengenalan Hardware Dan Topologi Jaringan) Harry@ Istecs. Org Http://Www. Istecs. Org/~ Harry*.
Pusvita, W. Y., & Huda, Y. (2019). ANALISIS KUALITAS LAYANAN JARINGAN INTERNET WIFI.ID MENGGUNAKAN PARAMETER QOS (Quality Of Service). *Voteteknika (Vocational Teknik Elektronika Dan Informatika)*, *7*(1), 54. https://doi.org/10.24036/voteteknika.v7i1.103643
Putra, F. P. E., Baidawi, A., & Mubarok, A. A. (2023). Merancang Jaringan Sensor Nirkabel dan IoT untuk Kota Pintar Pamekasan. *Jurnal Informasi Dan Teknologi*, 138–145.
Putra, F. P. E., Putra, D. A. M., Firdaus, A., & Hamzah, A. (2023). Analisis Kecepatan Dan Kinerja Jaringan 5G (generasi ke 5) Pada Wilayah Perkotaan. *INFORMATICS FOR EDUCATORS AND PROFESSIONAL: Journal of Informatics*, *8*(1), 47–51.
Putra, F. P. E., Riski, M., Yahya, M. S., & Ramadhan, M. H. (2023). Mengenal Teknologi Jaringan Nirkabel Terbaru Teknologi 5G. *Jurnal Sistim Informasi Dan Teknologi*, 167–174.
Raharjo, Y. I., & Danaryani, S. (2018). Pengujian Performansi Layanan FTTH Menggunakan Sofware Axence Net Tools dan Wireshark. *Seminar Nasional Teknik Elektro*, *3*(2), 294–298.
REPEATER, M. D., & SUDRAJAT, Y. A. (n.d.). *UPAYA MENINGKATKAN JANGKAUAN SINYAL WIFI*.
Rohall, C. (2005). Perbedaan minat dalam penggunaan fungsi internet berdasarkan tipe kepribadian. *Jurnal Psikologi Vol*, *3*(2), 89.
Rohaya, S. (2008). Internet: pengertian, sejarah, fasilitas dan koneksinya. */Jurnal/Fihris/Fihris Vol. III No. 1 Januari-June 2008/*.
Utami, P. R. (2020a). Analisis Perbandingan Quality of Service Jaringan Internet Berbasis Wireless Pada Layanan Internet Service Provider (Isp) Indihome Dan First Media. *Jurnal Ilmiah Teknologi Dan Rekayasa*, *25*(2), 125–137.
Utami, P. R. (2020b). Analisis Perbandingan Quality of Service Jaringan Internet Berbasis Wireless Pada Layanan Internet Service Provider (Isp) Indihome Dan First Media. *Jurnal Ilmiah Teknologi Dan Rekayasa*, *25*(2), 125–137. https://doi.org/10.35760/tr.2020.v25i2.2723
Wardiana, W. (2002). *Perkembangan teknologi informasi di Indonesia*.
Wongkar, S., Sinsuw, A. A. E., & Najoan, X. (2015). Analisa implementasi jaringan internet dengan menggabungkan

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jaringan lan dan wlan di desa kawangkoan bawah wilayah amurang ii. *Jurnal Teknik Elektro Dan Komputer*, *4*(6), 62–68.

Yuliana, O. (2000). Penggunaan teknologi internet dalam bisnis. *Jurnal Akuntansi Dan Keuangan*, *2*(1), 36–52.

Zhong, Z., Kulkarni, P., Cao, F., Fan, Z., & Armour, S. (2015). Issues and challenges in dense WiFi networks. *2015 International Wireless Communications and Mobile Computing Conference (IWCMC)*, 947–951.

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