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JUDUL : PERFOMANCE OF VIDEO CONFERENCING IN THE TECHNOLOGY 802.11N

SESI PENGAJIAN : 2010 / 2013

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PERFORMANCE ANALYSIS OF VIDEO CONFERENCING SOFTWARE IN TECHNOLOGY 802.11N

NABILA BINTI RUSLAN

This report is submitted in partial fulfilment of the requirements for the Bachelor of Computer Science (Software Development)

FACULTY OF INFORMATION AND COMMUNICATION TECHNOLOGY
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2011

DECLARATION

I hereby declare that this project report entitled

PERFOMANCE OF VIDEO CONFERENCING IN TECHNOLOGY 802.11N

is written by me and is my own effort and that no part has been plagiarized without citations.

STUDENT : NABILA BINTI RUSLAN Date: 29-AUG-2013

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DEDICATION

This work is dedicated to my supervisor, lecturers, beloved family and siblings, who respect for education and for the juniors that will used my research later.

To not be forgotten to my supportive friends and my lecturers, thank you so much for assist and help. And many thanks for not dropping out of hope and support throughout my Final Year Project or Projek Sarjana Muda.

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ABSTRACT

My Final Year Project project was on the performance of video conferencing software in the technology 82.11n. This project is to see where the most excellent software used for video conferencing based on the time delay, jitter and throughput value. This project requires three comparable software for Skype, ooVoo, and Google Talk. This project tested within 30 seconds to get a reading of data. The software used to capture data is Wireshark. All data will be incorporated and made a conclusion through the graph and rating will be based on the assessment data. The objectives of this project are to see which software has a better performance in the classes of data throughput, jitter and delay time, to get the result of the data Throughput, jitter and delay time and to monitor the data traffic of the video call video calling.

ABSTRAK

Projek Projek Tahun Akhir saya adalah mengenai prestasi perisian persidangan video dalam 82.11n teknologi. Projek ini adalah untuk melihat di mana perisian yang paling baik digunakan untuk persidangan video berdasarkan masa tunda, ketar dan pemprosesan nilai. Projek ini memerlukan tiga perisian setanding untuk Skype, ooVoo, dan Google Talk. Projek ini diuji dalam masa 30 saat untuk mendapatkan bacaan data. Perisian digunakan untuk menangkap data Wireshark. Semua data akan dimasukkan dan membuat kesimpulan melalui graf dan penarafan akan berdasarkan data penilaian. Objektif projek ini adalah untuk melihat perisian mempunyai prestasi yang lebih baik dalam kelas pemprosesan data, ketar dan kelewatan masa, untuk mendapatkan hasil Throughput, ketar dan kelewatan masa data dan untuk memantau trafik data daripada video panggilan video memanggil.

TABLE OF CONTENT

CHAPTER	SUBJECT	PAGE
	DECLARATION	**ii**
	DEDICATION	**iii**
	ACKNOWLEDGEMENTS	**iv**
	ABSTRACT	**v**
	TABLE OF CONTENT	**vii**
	LIST OF TABLES	**viii**
	LIST OF FIGURE	**x**
	DECLARATION	**ii**
CHAPTER I	**INTRODUCTION**	
	1.1 Project Background	2
	1.2 Problem Statement	3
	1.3 Objective	3
	1.4 Scope	4
	1.5 Project Significant	4
	1.6 Expected Output	4
	1.7 Conclusion	5
CHAPTER II	**LITERATURE REVIEW**	
	2.1 Introduction	6
	2.2 Facts and Findings	7
	2.2.1 Domain	6
	2.2.2 Keyword	9
	2.2.3 Previous Research	11
	2.3 Proposed Solution	11
	2.4 Conclusion	12

CHAPTER III	**METHODOLOGY**	
	3.1 Introduction	13
	3.2 Problem Analysis	14
	3.3 System Development	14
	3.4 Project Schedule and Milestone	15
	3.5 Conclusion	18
CHAPTER IV	**DESIGN AND IMPLEMENTATION**	
	4.1 Introduction	19
	4.2 Project Requirement	20
	4.2.1 Software Requirement	20
	4.2.2 Hardware Requirement	21
	4.3 Project Architecture	22
	4.3.1 Projects Network Design	23
	4.3.2 Projects Physical Design	23
	4.3.3 Project Logical Design	24
	4.4 Project Analysis Outputs	25
	4.5 Conclusion	29
CHAPTER V	**TESTING AND ANALYSIS**	
	5.1 Introduction	30
	5.2 Test Plan	31
	5.2.1 Test Organization	31
	5.2.2 Test Environment	31
	5.2.3 Test Schedule	33
	5.3 Test Strategy	34
	5.3.1 Projects Network Design	34
	5.4 Test Method	35
	5.4.1 Software Setup And Installation	36
	5.5 Test Output	39
	5.5.1 Analysis of Data	39

	5.5.1.1 Delay Time	39
	5.5.1.2 Jitter	49
	5.5.1.3 Throughput	58
	5.6 Analysis of Testing	61
CHAPTER VI	**PROJECT CONCLUSION**	
	6.1 Research Summarization	64
	6.2 Observation on Weaknesses and Strength	65
	6.3 Proposition for Improvement	66
	6.4 Contribution	67
	6.5 Conclusion	67

TABLE OF FIGURE

NO	LIST OF FIGURE	PAGE
1	Figure 2.1 : www.lifehacker.com	10
2	Figure 3.1 : Incremental Development Process	14
3	Figure 4.1 : Video conference Architecture	22
4	Figure 4.2: Physical Design	23
5	Figure 4.3: Logical Design	24
6	Figure 4.4 : Skype Interface	25
7	Figure 4.5 : Wireshark Interface	26
8	Figure 4.6 : Wireshark Interface	26
9	Figure 4.7 : Information of the captured data	27
10	Figure 4.8 : The graph at the start of the video chat	28
11	Figure 4.9 : The graph at the end of the video chat	28
12	Figure 4.10 : The graph analysis	29
13	Figure 5.1: Interface of Wireless Setting	34
14	Figure 5.2 : Skype's Interface	36
15	Figure 5.3 : Google Talk's Interface	36
16	Figure 5.4: OoVoo's Interface	37
17	Figure 5.5: Wireshark Network Analyzer's Interface	37
18	Figure 5.6: Selected Network in Wireshark	38
19	Figure 5.7: Delta time of the Skype video conferencing	40
20	Figure 5.8: Port number for Skype	41
21	Figure 5.9: Save file as CSV	41
22	Figure 5.10: Excell's data	42
23	Figure 5.11: Delta time of the Skype video conferencing	43
24	Figure 5.12: Port number for ooVoo	43
25	Figure 5.13: Save file as CSV	44
26	Figure 5.14: Excell's data	45
27	Figure 5.15: Delta time of the Skype video conferencing	46

28	Figure 5.16: Port number for ooVoo	46
29	Figure 5.17: Save file as CSV	47
30	Figure 5.18: Excell's data	48
31	Figure 5.19: The data for R(0) and S(0)	50
32	Figure 5.20: The data for R(1) and S(1)	50
33	Figure 5.21: The data for R(2) and S(2)	51
34	Figure 5.22 : The data for R(0) and S(0)	53
35	Figure 5.23 : The data for R(1) and S(1)	53
36	Figure 5.24 : The data for R(2) and S(2)	54
37	Figure 5.25 : The data for R(0) and S(0)	55
38	Figure 5.26 : The data for R(1) and S(1)	55
39	Figure 5.27 : The data for R(2) and S(2)	56
40	Figure 5.28 : Throughput of Skype	58
41	Figure 5.29: Throughput of ooVoo	59
42	Figure 5.30: Throughput of Google Talk	60
43	Figure 5.31: Graph of Delay Time	61
44	Figure 5.32: Graph of Jitter Time	61
45	Figure 5.33 : Graph of Throughput	62

CHAPTER I

INTRODUCTION

In computer communication, IEEE 802.11 is an implementation of wireless local area network with a 60GHZ frequency bands. The pioneer version of IEEE 802.11 technology was released in the year 1997 and had been amended several times. In IEEE 802.11, a few protocols that consist of half-duplex modulation technique. In the group of IEEE802.11 consist of IEEE 802.11a, IEEE 802.11b, 802.11g and IEEE 802.11n. IEEE 802.11 is a set of standards that use wireless networking transmission method that particularly within corporate workspace. In the families of IEEE 802.11, IEEE 802.11n is the latest technology that the data rate is up to 600Mbit/s and using one 40 MHz-wide channel with the maximum of four spatial streams. Modulation and Coding Scheme index value was represented for

modulation schemes and coding rates. In the IEEE 802.11n is an extended of management to protect the transmissions which include IEEE 802.11g, IEEE 802.11b and IEEE 802.11a. In IEEE 802.11n, there are MAC and PHY level of protection mechanisms that needs to complete the organization. IEEE 802.11n can be used in the video call communication.

Video call and known as videophone or video conferring is a medium to communicate between two parties in the different place by seeing and hearing to each other at the same time. Nowadays people get to use this kind of communication to communicate to each other in different country. Based on the statistics shows in the internet, most people used Skype, Google Talk and ooVoo to make a video call. This research is to see which software has the better performance to make a smooth video call. The packet data loss, jitter and delay time describes the performance of the software for video call.

1.1 Project background

This research is about finding the performance of the video call in term of packet data loss, jitter and delay time through the same technology which is IEEE 802.11n. To complete the research, few software is needed to capture and monitor the data in and out process. There are many factors that should be considered. For example is the internet connection must be at the same rate. The project should be well planned to avoid a major problem during capturing the data of the video call.

1.2 Problem statement

During the project, there might be a few problem causes by several factors. For example :

1. Nowadays, there a lot of video call free software to be installed. But, users do not know which software is the best software to be used.

2. Since there are a lot of websites showing the specification and the software details, but those websites does not show the performance details of the software.

3. How to monitor the data traffic of the software during video calling.

1.3 Objective

The objectives that want to achieve are:

1. To see which software has a better performance in the classes of packet data loss, jitter and delay time.
2. To get the result of the packet data loss, jitter and delay time.
3. To monitor the data traffic of the video call during video calling.

1.4 Scope

Those are the software that need to complete the project :

Sniffing tools

- WIRESHARK – This software is used for data monitoring and to capture the data during video call.

Video call software :

- Skype
- Google Talk
- ooVoo

1.5 Project Significance

The project significance of this research is to analyse the performance of the video call in term of packet loss, jitter and delay time in different type of software. This project might be usefull to users and give the output result to choose the better video call software.

1.6 Expected Output

At the end of this research, the packet data loss, jitter and delay time will be shown in the form of graph.

1.7 Conclusion

IEEE 802.11 is a set of standard that use wireless networking transmission methods and it seen like the worldwide implement it particularly within the cooperate workspace. Recently many countries in the world are allowing operation in the 5.47 GHz to 5.725GHz using the method in the technology IEEE 802.11h and IEEE 802.11n as a secondary medium for sharing file. The technology of IEEE 802.11n is a standard that improves the previous standard which are IEEE 802.11a and IEEE 802.11g and increase the maximum net data rate in the range of 54-600Mbits/s with four spatial streams.

CHAPTER II

LITERATURE REVIEW

2.1 Introduction

This chapter will discuss briefly about the performance of the related published information about the technology of IEEE 802.11n. Literature review is to collect the related data, analysis, project processess and conclusion. This chapter also explained several research of the project the technology IEEE 802.11n from the previous author. By the end of this chapter will come out with the conclusion and comparison from these three author according to their research.

2.2 Facts and Findings

Facts and finding is finding the facts of the technology IEEE 802.11n to find out the information more details. Nowadays, the current internet technology used is IEEE 802.11n especially for media communication type. This technology has been used so rapidly in wired or wireless technology. In the top ten reviews for the most used of video conference software are Windows Live Messenger, Yahoo Messenger and paltalk.com. These three software are user friendly software and easy to install. Those three software are also had a good video features. These software are allowed to make a group video conference. This set of protocols can be used in wireless or LAN connection. This protocol is a wireless standard that enable high-bandwidth

application such as streaming a video conference with the wireless VoIP. VoIP can support video conferencing systems, video phone, webcams and camera. VoIP can also support advanced features to improve the quality of video conference such as the scalability and the functionality.

2.2.1 Domain

As stated in the research of Wenjing Wang from the University of Central Florida Orlando in the Vehicular Technology Conference in the year 2007. Live video streaming over vehicular ad hoc networks (VANET) is an attractive feature to many applications, such as emergency live video transmission, road-side video advertisement broadcasting and inter-vehicle video conversation. Though vehicles have ample bandwidth, computation and storage capacity to support data intensive communication, the high mobility may cause persistent network partition. The performance of video streaming suffers from the delay and packet loss incurred by the long-time disconnection. Although many solutions have been proposed to handle the high mobility problem, few of them addressed the problem in the context of video transmission. In this paper, we focus on video streaming between vehicles in highway, where the traffic density is adequate to mitigate frequent link disconnections and persistent network partitions.

As stated in Aleksander Kostuch, Krzystof Gierlowski and Jozef Wozniak in their article tittles Performance Analysis of Multicast Video Streaming in IEEE 802.11 b/g/n Testbed Environment in year 2009. The results of their research show a strong dependence of the quality of video streaming on the chosen transmission technology. At the same time there are significant differences in perception quality between multicast and unicast streams, and also between devices offered by different manufactures. The overall results seem to demonstrate, that, while multicast support quality in different products is still varied and often requires additional configuration, it is possible to select Wifi access point model and determine the best system parameters to ensure a good video transfer conditions in terms of acceptable Quality of Perception/Excellence (QoP/E).

In the research of Frank H.P Fitzek, Basak Can, Ramjee Prasad and Marcos Katz with the tittles of Traffic Analysis and Video Quality Evaluation of Multiple Description Coded Video Services for Fourth Generation Wireless IP Network in year 2005. For the performance evaluation of the future wireless communication systems, such as the fourth generation wireless networks, traffic traces of realistic services are needed. Multiple descriptions coding (MDC) is gaining a lot of interest lately and is a variables solution to provide robust video services over single or multi hop wireless networks and MDC introduces more flexibility for network coding. Furthermore it has the capability to support heterogeneous terminals as they are accepted to be used in 4G wireless networks.

2.2.2 Keyword

i. Video Conferencing

Video conferencing is media communication software that enables two or more people to communicate in different location through camera. Video conferencing conducting two ways of communication through computer network to transmit audio and video data. This kind of communication software is developed commercially in the United States by AT&T Cooperation during the early 1970s. Video conferencing uses audio and video communications to complete the communication. This kind of communication needs an internet connection to allow the video conferencing. The important components that needs in video conferencing including video input, video output, audio input, audio output, data transfer and computer. Those requirements needed as a console with a high quality remote control to ensure the high quality of video conferring.

ii. Top rated video conference software.

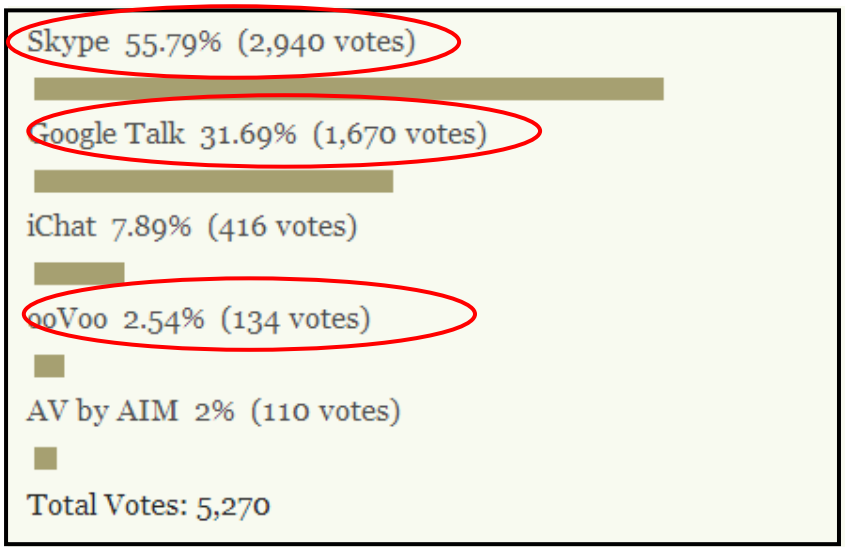

Figure 2.1 : *www.lifehacker.com*

Based on the statistic from Alan Henry in the website lifehacker.com, those are the statistic of the top video conferring software based on the vote. Skype is the highest rating among the software with the 55.79 percentage and 29440 votes. Skype is software that was purchased by Microsoft and it is video conferring software that available for pc, tablets and mobile device and it is easy to use.

Right inside the popular video conference software is Google Talk software. Google Talk allows for free calls to any phone number in United States with the service until 2012. Google Talks application available in Android application but does not allow video chat it is available for chatting only. While the other video conference software which is ooVoo. OoVoo is a new video conference that allows a group of video chatting. The group of video chatting ability to put maximum 3 person for free. This application is available in pc, Android and iOS.

2.2.3 Previous Research

According to research of Khan, A from University of Plymouth in his research's tittle Impact of video Content on Video Quality for Video over Wireless Networks – Video streaming is a promising multimedia application and is gaining popularity over wireless/mobile communications. The quality of the video depends heavily on the type of content. The aim of the paper is threefold. First, video sequences are classified into groups representing different content types using cluster analysis based on the spatial (edges) and temporal (movement) feature extraction. Second, we conducted experiments to investigate the impact of packet loss on video contents and hence find the threshold in terms of upper, medium and lower quality boundary at which userspsila perception of service quality is acceptable.

2.3 Proposed Solution

In this cases, to check the quality of video conferring is by looking at the packet data loss, jitter time and delay time during conversation. There are a lot of video conferring software available, but not all software has the best quality. The proposed solution to overcome that problem is using the performance testing or Wireshark software. The data transferred can be captured during the video conferring and the performance of the video conferring can be calculated and measured.

2.4 Conclusion

There a lot of 3. that can be used for video conferring, but these chosen software are the most used software in the world. Basically, people only know the function of the video conference software and enjoy themselves using it. They do not know which actually the better software to use and have better features. This project will come out with the result the better software to use and have the better quality by looking at the packet data loss, jitter packet and the delay time.

CHAPTER III

METHODOLOGY

3.1 Introduction

This chapter will discuss about the methodology of the performance of video call in technology IEEE 802.11n. In the methodology should included phases, method, tools, flow diagram and the milestone. This chapter will also explain the specification of software to use to complete this research.

3.2 Problem Analysis

Packet data is hard to translate because it cannot be read normally like usually we read the alphabetical and cannot be held by hand. However, there are a few way to understand how the packet data moves and where does it goes. Packet data can be understand by analyse the message and find out the details of protocol operation by using suitable software. Wireshark is one of the suitable software to capture, translate and analyse the data. The output of the data can be translated into a graph form that can be understand easily.