

# **QoS OF LIVE VIDEO STREAMING OVER IPV4 IPV6**

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## BORANG PENGESAHAN STATUS TESIS

JUDUL: QoS OF LIVE VIDEO STREAMING OVER IPV4 IPV6

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# **QoS OF LIVE VIDEO STREAMING OVER IPV4 IPV6**

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This report is submitted in partial fulfillment of the requirements for the Bachelor of  
Computer Science (Computer Networking)

**FACULTY OF INFORMATION AND COMMUNICATION TECHNOLOGY  
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**2011**

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## DEDICATION

To my parents, thank you for your sacrifice and love. No such compensate except Allah.

To my others family, your support and encouragement give me strength to finish this study.

To teachers, thank you for all the knowledge. May your knowledge are beneficial and useful for all humanity.

May Allah forgive us all.

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## ABSTRACT

This project will be conducted an examination of Quality of Service on live video streaming over IPv4 and IPv6. Quality of Service (QoS) generally describes the assurance of sufficiently low delay and packet loss for certain types of applications or traffic. Currently, we have new generation of IP address, which is IPv6 due to exhaustion of IPv4 addressing. Furthermore, the use of Internet is much more increasing by now. This project is using three parameters in order to determine the result, like jitter, throughput and packet loss. The findings that will be revealed in the end of this project will help people, especially network professional to understand more about IPv6 performance. Used of real-time application like live video streaming is highly demanded right now. Consequently, this project is intended to make a comparison of performance shown by two different IP networks, on live video streaming. Three test beds will be conducted, consists of IPv4 network, IPv6 network and Dual Stack network. In addition, all three protocols are being tested in two different environments. Firstly in a clean network without any other traffic, and secondly in a network with a background traffic.

## ABSTRAK

Projek ini akan dilakukan dengan membuat penilaian berkaitan Kualiti Servis (QoS) video siaran langsung melalui rangkaian IPv4 dan IPv6. Kualiti Servis (QoS) umumnya menggambarkan jaminan kelewatan yang cukup rendah dan kehilangan paket untuk beberapa jenis aplikasi atau trafik di dalam rangkaian. Ketika ini, kita mempunyai generasi baru di dalam alamat protokol internet iaitu Ipv6 disebabkan oleh kekurangan alamat dari IPv4. Tambahan lagi, penggunaan Internet sekarang semakin meningkat. Projek ini akan menggunakan tiga parameter untuk menentukan keputusan akhir iaitu seperti *jitter*, *throughput* dan *packet loss*. Penemuan yang akan terungkap pada akhir projek ini akan membantu orang ramai, terutamanya rangkaian profesional untuk memahami lebih lanjut mengenai prestasi IPv6. Penggunaan aplikasi *real-time* seperti video siaran langsung sangat meningkat sekarang. Oleh kerana itu, maka projek ini bertujuan untuk membuat perbandingan prestasi di dalam video siaran langsung antara dua protokol Internet yang berbeza. Tiga eksperimen akan dilakukan, terdiri daripada rangkaian IPv4, rangkaian IPv6 dan rangkaian *Dual Stack*. Sebagai penambahan, ketiga-tiga protokol ini akan di uji di dalam dua persekitaran yang berbeza, iaitu di dalam rangkaian tanpa gangguan trafik, dan rangkaian dengan gangguan trafik.



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## **CHAPTER I**

### **INTRODUCTION**

#### **1.1 Project background**

This project examining the Quality of Service on live video streaming over IPv4 and IPv6. Quality of Service (QoS) generally describes the assurance of sufficiently low delay and packet loss for certain types of applications or traffic. Guarantees of QoS are important if the network capacity is limited, especially for real-time streaming multimedia services, since these often required fixed bit rates and are delay sensitive (Wikipedia, Rkinder, 2001). According to JM Lee *et al.* (2008), QoS is affected by various factors, which include bandwidth, drop rate, delay, jitter and etc. This project will be using three parameters in order to determine the namely jitter, throughput and packet loss. Currently, we have new generation of IP address, which is IPv6 due to exhaustion of IPv4 addressing. But, there are no many people use it or for worse, know it. Furthermore, the use of Internet is much more increasing nowadays. Use of real-time application like live video streaming is highly demanded right now.

Real-time transport of live video is the predominant part of real-time multimedia (Dapeng Wu et al. (2001)). In the streaming mode, the video content need not be downloaded in full, but is being played out while parts of the content are being received and decoded. Due to its real-time nature, video streaming typically has bandwidth, delay and loss requirements. Consequently, this paper is intended to make a comparison of performance shown by two different IP networks, on live video streaming. Two networks, which one apply IPv4 and IPv6 network will be implemented to test and find the differences.

## **1.2 Problem Statements**

Much research has been done on comparison between IPv6 and IPv4 standards, and many IPv6-IPv4 test beds have been deployed to demonstrate the findings. However, there are not so many about the performance of both internets protocol in multimedia networking, especially in live video streaming. Some researcher also mentioned in their paper that under this media streaming services, conducting quality assessment is still has not widely addressed by the network research community. Moreover when this issues comes between the same performance comparisons on two different versions of internet protocol on more than two numbers of hosts the only few research paper can be found as documented. These days, the increasing of Internet Address space now becomes a real challenge for Network professionals. IPv6 was designed for not only increase the space of IP address but also overcoming the overall problems of IPv4 such as scalability, security and Quality of Services. Though, people still not convinced to using IPv6 network, especially in video streaming and for worst some still not aware on existence of IPv6. This paper will reveal all the answer to the problems above.

### 1.3 Objective

The main objectives of this study are:

- Identify how a network with IPv6 works on multimedia application.
- Measuring network QoS through the next generation protocol called Media Delivery Index.
- Analyzing the differences of QoS between IPv4 and IPv6 of internet protocols through video streaming.

This paper concerns on knowledge about IPv6 network performance and issues. The findings that will be revealed in the end of this project will help people, especially network professional to understand more about IPv6 performance. This paper also intended to discuss in what way IPv6 works on multimedia application, particularly in live video streaming. Another aim of this paper is measuring network QoS through the next generation protocol called Media Delivery Index, in order to get all the findings. With all the findings reveal soon, the gaps of QoS between both internet protocols through video streaming will be analyzed. During the experiment, the developed test-bed will be including more than two hosts. This will help another researcher to discover in which test-beds the multimedia application will perform better.

### 1.4 Scope

The scope of this project covers areas toward QoS functionalities between two internet protocol networks namely IPv4 and IPv6. In conducting this experiment, two different operating systems will be use. Initially all of the experiments would have done through two workstations namely Windows Server 2008 and Linux. QoS parameters that will be covered or measure are jitter, throughput and packet loss.

### **1.5 Project Significance**

This project will help any network researcher or professionals concerning on awareness about IPv6 performance, and help them to overcoming IPv6 issues. As known, research and works on multimedia application like video streaming is rarely documented. This paper will help any network people to enhance this topic to the next level. Moreover, people will know better how to determine network performance using Media Delivery Index that has been introduced by IETF. As the test-beds being developed using more than 2 hosts, it will help network researcher in consideration of adding more hosts in the future works.

### **1.6 Expected Output**

Based on MDI this research work will broadly analyze the gap of QoS between two versions of Internet protocols based on real time application, notably the delay and bandwidth. The precise attention will be given to the performance of the live video streaming because it is an important component of internet multimedia. Initially all of the experiments would have done through two workstations on two different operating systems namely Windows Server 2008 and Linux. In the first stage the proposed test-bed will be IPv4 supportive and will use to trace the video performance on it. In the later portion, the whole test bed will be activated for an IPv6 protocol suit and will be doing all the previous performance measurements for evaluation the dual stack MDI. The expected result will be shown in a graph that shows the comparison in these different networks and test-beds.

## 1.7 Conclusion

This project will be examining the Quality of Service on live video streaming over IPv4 and IPv6. QoS is a set of service requirements (performance guarantees) to be met by the network while transporting a flow. Nowadays, we have new generation of IP address, which is IPv6 due to exhaustion of IPv4 addressing. But, there are no many people use it. Furthermore, the use of Internet is much more increasing by now. Used of real-time application like live video streaming is highly demanded right now. So, this paper is intended to make a comparison of performance shown by two different IP networks, on live video streaming. Three test beds will be conducted, consists of IPv4 network, IPv6 network and Dual Stack network.

## **CHAPTER II**

### **LITERATURE REVIEW AND PROJECT METHODOLOGY**

#### **2.1 Introduction**

In this chapter, the literature review of previous research has been made. A literature review is a part of the overview and critical analysis including substantive findings as well as theoretical and methodological contributions of relevant published articles, research reports, and thesis on the topic or issue to be investigated. A literature review usually leads a research proposal and result section. The objective of literature review is to bring the reader up to date with current literature on a topic and forms the basis for another goal. In favor of doing this literature review of this project, three paper have been researching for. The subjects that have been review in these three papers are methodologies, technique and software, as well as hardware. Understanding the literature based on research topic will prevent from repeating previous errors, or redoing work which has already been done. It will also give the insights into aspects of the topic which might be worthy of exploration and future research.