CHAPTER 1

INTRODUCTION

This chapter presents the aim of this project. Background, problem statement and objectives, scope and the benefit of the project are discussed.

1.1   Background

Communications companies have been dabbling in this technology essentially since the invention of television. It was mostly impractical or limited in its use, however before the advent of broadband internet. Early devices often suffered from poor picture quality. Videophone, which became available in the 1970s never became popular because they were quite expensive. With the arrival of broadband internet in the 1990s, however users could engage in video conferencing through their home computers simply by buying webcams and the appropriate.

We all communicate, every day during work or leisure time with friends, college, company, organization adversaries and often with ourselves. Until quite recently we had to see or hear the others if we wanted to communicate with him or her personally. This is certainly not true anymore telephones, mobile phones, Internet because now we can communicate with the others and the same time based communication.

We have seen a very fast and large scale development of communication network in the last decade. During the past decades the evolution of these network technologies has enabled the development to better achieve user's satisfaction. New innovations in next generation networks are also emerging subject to the demand of users. An IMS is an evolving definition of an architecture that solves the continuing demands and frustrations of users and enterprises. It is a whole new way to deliver multimedia services regardless of the device and will change the way all of us relate to our increasingly digital world. At present, with increasing number of demand driven applications, different types of services are available to fulfill the expectation of users. Against this backdrop, efficient, high quality of service is required to sustain and the performance the quality of the multifarious services aspiring to satisfy user satisfaction. The real-time applications such as voice and video conferencing have a great deal of demand over IMS network. A real-time, two-way exchange of information between two or more geographically disperse locations using video, audio and sometimes data. This need is much more expedient in real-time application such as voice and video conferencing, QoS has enormous importance in providing efficient services in order to fulfill the user's expectation.

1.2   Problem Statements

The necessity of QoS is one of the key issues in order to design and analyze the IMS networks. The IMS network offers guarantees about the amount of bandwidth a user gets for a particular connection or about the delay the packets experience. Due to the ubiquitous bandwidth limitations for real-time applications in IMS network such as voice

and video and with increasing number of application, service classification and efficient resource management are quite laborious tasks. Proper resource and traffic management are important factors to handle different types of applications in the network to improve the service quality in video transmission. In order to manage the resources and to handle the traffic properly in the network, QoS performance is necessary to provide better service as well as to fulfill the user's expectations.

The primary approach in achieving the intended outcome for this research work depends on ubiquitous research questions as bellows:

- How to improve the quality of video conferencing transmission in IMS network?

- What are needed to implement the QoS parameters for IMS network?

- How the QoS parameters of IMS network can provide support for video conferencing?

1.3   Objective

The objective of this thesis work is to evaluate the QoS performance of video conferencing on IntServ and DiffServ with MPLS in IMS network based on some important performance metrics such as end-to-end delay, packet loss, throughput and jitter.

The procedure will include:

- Create of the simulation model for video conferencing, different network attribute of OPNET Modeler.

- Discuss different constraints in IMS networks in particular end-to-end delays, packet loss, throughput and jitter of video conferencing.

- Simulate Model and graphs will depict the output of the performance metrics to realize and analyze the performance of the QoS with DiffServ over MPLS in IMS network.

- Recommend what should be added to improve the QoS in order to achieve reliable transmission and reception network from the evaluation of our result and the analytical observation with DiffServ over MPLS performance in IMS network.

1.4   Hypothesis

The hypothesis of this study is the MPLS with DiffServ will improve QoS in IMS network. MPLS is the double functionality which allows a better use of the resources from beginning to end. MPLS with DiffServ to ensure the quality of service required by the applications in the data processing networks for not only conveying accurately or increasing a certain traffic. Also conveying it as soon as possible while holding management account of the resource networks which implies a network management even more complex. The growth of the flows of access and the convergence of the services known as triple play (video conference on demand) on an infrastructure IP federator involve a considerable increase of volumes of IP traffic as well as new constraints in terms of quality of service and availability for IP networks.

1.5   Scope and Limitation

There are several scopes that need to be considered in order to fulfill the requirement of this project. The main scope of this project there are as bellow:

- We focused on the parameters that can guarantee QoS which can have great potential in improving some performance metrics such as end-to-end delay, packet loss, throughput and jitter (delay variation).

- The performance of the QoS parameters depends on the adaptability of the QoS parameters with the applications.

- OPNET Modeler 14.5 was used to design the model for simulation which was simulated in two scenarios. First scenario is IntServ with QoS, and second scenario is DiffServ with MPLS in IMS for video conferencing.

Research did not observe all of the video conferencing events that took place in the participating jurisdictions they select an implementation, high quality of service and software sample of events. As well the presence of the researchers in the video conferencing and voice when have influenced participants behavior.

1.6   Significance of Study

The significance of this study is, we can understand about IMS network and performance for video conferencing transmission in this network. We can understand, how to evaluate and analyzes performance of QoS metrics such as end to end delay, packet loss and jitter for video conferencing over IMS. Our implementation model as IntServ and DiffServ with MPLS can be performed in IMS network is better than others for video conferencing transmission.

To evaluate the QoS performance for video conferencing transmission on DiffServ with MPLS performance in IMS networks. In others, we used the tool as OPNET modeler we using to validate network models and analyze. So the evaluation is made by simulating in OPNET Modeler based on some performance metrics and to implement a video conferencing system with video, voice. The results are depending on simulation result.

1.7   Contribution

This thesis have two contributions. The first is an implementation two models such as IntServ and DiffServ with MPLS which can have great potential in improving the QoS scheme in IMS networks.

The second is to enhance the resource management, especially in the scheduling area as IntServ and DiffServ with MPLS for guarantee the network performance. So QoS performance is the important to provide better services.

1.8   Related Work

Different publications and contributions discussed the QoS evaluation over IMS. The authors of [18] described the model for QoS guarantee in IMS based video conference services.

They described how the SIP is to handle sessions, forms a major protocol of the IMS standard. They also discussed video conferencing is one of the most welcomed broadband services for business as well as residential users. The authors of [20] presented a new scheduling algorithm for delivering real time (internet streaming applications) in 3G network. The authors in [24] developed an approach which is architecture specifies a number of common functions and service enablers which can be reused across multiple access networks to enable multimedia services. They also described the richer users, multimedia user experiences, the proliferation of rich media capable mobile devices, both consumer and enterprise end users have become very savvy about the personalized, interactive, and real time demands they have communication services. The authors in [16] how to evaluate of architecture for IMS based video conferencing. They has implement supporting software which can be testing for user authentication, charging and security.

1.9   Advantage of Study Video Conferencing

The quality of service, conferencing it has importance, such as for the researching, education and business there are described bellow:

1.9.1   Advantage of Research

The video conference research has important for the best knowledge because this project will be shown about media processing video conferencing solution with IMS on the network. IMS has so many services but this thesis, we selected only conferencing for my research. Because now the day video conference the most in higher education and businesses. For aim this project we will found quality of service perform for the video conferencing result. The IMS based video conferencing can also bring additional advantages such as support for mobility enabling interaction with existing NGN service enablers, service personalization as well as provide converged application integrated video voice data and mobile services to flexible quadruple play service concept.

1.9.2   Advantage in Education

At its most basic level, video conferencing in education connects remote students to teachers. On a more exciting level, it also leads students on virtual tours, brings far away experts on camera for interviews and allows kids to try out their fledgling foreign language skills of their peers from other countries. While such activities might have been difficult in the past due to travel costs, time constraints and inconvenience classroom video conferencing can offer a work around solution. Video conferencing offers the broadest range of solutions to enable all users to connect successfully and conference in any environment. The integrated approach of video conferencing solution ensures that users receive a simple, consistent and enriching experience every time they interface with the unified collaboration environment.

Reach all your prospective students: Video conferencing works on broadband, mobile wireless data cards enabling. Video conference offers solutions to education practitioner's student researchers and administrators. By providing high quality true to life communications videoconferencing helps educators extend access to learning subject matter experts and improved project collaboration.

Primary, Secondary and Higher Education: Imagine the possibilities for teaching and research when students and faculty can experience remote places first hand and encounter faraway experts without leaving campus. Invite guest speakers to your class. Hold panel discussions with authorities from around the world. When travel costs and time limitations constrain access to subject matter expert videoconferencing makes interaction with them possible. Video conferencing, high definition solutions can accommodate all sizes of classrooms from auditorium size lecture halls down to remote single room schools in remote locations where access to higher education has traditionally been a problem. Every day, educators and trainers are tasked with providing a wide range of content and services to administrators, staff, students, stakeholders, and employees. Video conferencing technology transforms the learning environment for countless applications. Video conferencing of standards-based solutions enable educators and learners to meet and interactively collaborate with colleague's peers and content experts locally and remotely anywhere in the world.

1.9.3   Advantage in Business

The important of video conferencing in business is becoming increasingly popular as a way to facilitate meetings. Save time, money on travel and accommodation. By further reducing the travel we indirectly reduce the carbon emission to some extent thereby saving our plan. It can make meetings easier to arrange overcoming some of the difficulties of getting people from different places together at the same time. The bellows there is some of the key possible achievements by the use of video conferencing such as interviewing prospective staff, research group meetings, business meetings, teaching and distance learning, presentations, seminar presentations to remote audiences, public launches of new research projects and telemedicine.

1.10   Thesis Outline

In this thesis, Introduction are described in chapter 1. Background of IMS technology, network architecture of this study is given, the basic coverage of the area and theory to related is described in chapter 2. The simulation design and implementation are described whereas in chapter 3. Simulation results and analysis are described in chapter 4 and chapter 5 is concludes entire thesis work.