PROPOSAL THESIS RESEARCH

IP MULTIMEDIA PACKET DELAY AND TRAFFIC ANALYSIS

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ABSTRACT
IP Multimedia is a communication technology combines the wireless and wired network in a real time, extensible, and interactive multimedia service. The architecture that is IP-based standard that allows the convergence of fix and mobile communication device, multiple networks and multimedia applications. Using IMS, applications can combine voice, text, pictures, and video in seamless call sessions. Because it uses bandwidth in order to run the multimedia application, the constrain are like traffic and delay

Keyword: IMS, IP Multimedia Subsystem, Analysis

I. INTRODUCTION
The IP Multimedia Subsystem (IMS) is the core of Next Generation Networking (NGN) of telecommunication services which provide mobile and fixed multimedia services. IMS developed by the 3rd Generation Partnership Project (3GPP) and is based on Session Initiation Protocol (SIP) and run over standard the Internet Protocol (IP)

II. BACKGROUND

A. The History of IMS
In the new era of telecommunication industry, the ICT industry has to have different services which become main differentiator to compete end-users’ heart and the next big thing in technology is IP Multimedia Subsystem (IMS). IMS is 3GPP (3rd Generation Partnership Project) standardized Next Generation Network (NGN) architecture integrates the services provided by the long-existing IP network with the mobility of portable digital devices such as your 3G cellular phone. It combines the wireless and wired network in a real time, extensible, and interactive multimedia service. Also allows the convergence of fix and mobile communication device, multiple networks and multimedia applications. Using IMS, applications can combine voice, text, pictures, and video in seamless call sessions.

IMS can fill the gap between the two most successful communication paradigms, Cellular and Internet technology. The vision of IMS is to provide cellular access to all the services that the Internet provide, so you can surf the Web, play an online game or join a video conference no matter where you are using your 3G handheld device.

B. The Architecture
The architecture of IMS supports a wide range of services that are enabled based on SIP protocols. It delivers multimedia services that can be accessed by a user from various devices via an IP network or traditional telephony system. The underlying network architecture can be divided into three layers (Device Layer, Transport Layer, and Control Layer) plus the service layer and will be introduced from bottom to top respectively.
C. The Benefit

Now a day everyone already familiar with accessing Internet services like Web access, email, or instant messaging via a 2.5G and 3G cellular phone. The idea of IMS is as a way to offer Internet services everywhere using cellular technology. So why do we need IMS?

The benefits of IMS over the existing cellular network infrastructure can be demonstrated in the following four aspects.[1]

1) IMS provides a common platform to reduce time-to-market for rolling out new multimedia services: One of the biggest challenges in today’s communication network is to improve the long and costly process for creating a new service. Service providers are looking for ways to reduce the time-to-market for rolling out new multimedia services. The IMS infrastructure solves this problem by providing the standardized platform and reusable components. The standardized interface and common features provided by IMS infrastructure enables service providers to easily adopt a service created by third parties and create a service that integrates with many services effectively. In addition, with the standardized interface provided by IMS, the service is no longer solely provided by a single provider; any provider who implements the standardized interface can provide the service. The multi-vendor service creation industry leads to an open market, and allows service providers to choose the most effective way to roll out new services.

2) IMS provides multimedia services with Quality of Service (QoS) enablement. Although the dramatically increased bandwidth in 3G cellular networks provides a much faster and more reliable Internet access compared with 2.5G cellular network, there are no guarantees about the quality of the services. A 3G cellular network provides what is known as "best effort", which means the network, will do its best to ensure the required bandwidth, but there is no guarantee it will remain at the same level. Consequently, the bandwidth of a particular connection can vary significantly over time. In order to solve this problem, Quality of Service (QoS) mechanisms were developed in order to provide certain guarantee levels of network bandwidth during transmission instead of the so called "best effort". IMS specifies enablement of Quality of Service within the IP network and takes advantage of the QoS mechanism to improve and guarantee the transmission quality.

3) IMS allows operators to charge multimedia session appropriately: If a user uses videoconference over the 3G cellular network, there is usually a large data transfer that consists of audio and video. This is usually expensive since the operator will generally charge by the number of bytes transferred. On the other hand, if the operator is willing to provide a

![Figure 1 - IMS Architecture Diagram](image)

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different charging scheme based on the actual service type, it may be more beneficial to the
users. The advantage of IMS is that it provides information about the service type being
invoked by the user and thus allows the operators to determine how to charge the users based
on service types, i.e. they can choose to charge user by the number of bytes transferred, by the
session duration (time-based), or perform any new type of charging.

4) IMS allows all services to be available irrespective of the users’ location: A typical and
particularly annoying problem when working with cellular technology is that some of the
services will not be available when the user is roaming in another country. To resolve this
problem, IMS uses Internet technologies and protocols in order to allow users to move across
the countries and still be able to execute all the services as if they were from their home
networks

III. CONSTRAINTS AND SCOPE OF WORK

The vision of IMS is to provide cellular access to all the services that the Internet provides. That can
enable a rich set of converged services, which makes at the same time, open up networks to a host of
known IP-based vulnerabilities, which can often be addressed by existing firewalls, and also to a
completely new set of IMS application vulnerabilities.

The potential attacks that may exist in IMS networks, the more prevalent and potentially damaging
application level threats that can be used to attack the core infrastructure and take down the service or
used to attack the end-users are: [3]

- Flood DoS and Distributed Floods
- Protocol Fuzzing
- Stealth Floods
- VoIP Spam
- Fraud
- Rogue Devices
- Traffic
- Bandwidth

IP multimedia Subsystem is implemented on top of IP and SIP protocols. So it is important to protect the
IMS core elements from intruders. Because it is still vulnerable to several attacks, so it must be prevented.

The scopes of work of this research are in the bandwidth traffic and the delay of running IP multimedia
application, which are VoIP and Video conference.

IV. METHODOLOGY AND RESEARCH PURPOSE

The methodology that author use are:

- Literature study
  Searching, Reading and learning the related research or book which related to packet delay and
traffic analysis
- Analysis the problem
  Experiment with the IP Multimedia application and combine with QoS, then monitoring the
bandwidth traffic and delay
- Simulation and analyze the data
  Doing few experiments and analyzes the bandwidth traffic and delay
The purposes of this research is to analyze the traffic and delay in IP Multimedia and the tool that author use are WireShark and Network Traffic

V. ACKNOWLEDGEMENT
This paper is to fulfill the assignments of IP-based telecommunications course.

VI. REFERENCES

RESEARCH SCHEDULE

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