

CHAPTER I

INTRODUCTION

1.1 Background

Operators of wireless access networks these days often intentionally try to reduce signaling for VoIP traffic going over their infrastructure since it destroys their revenue. A deployed IMS network will put those operators into a position where they have a secured and chargeable environment at hand. Since the IMS acts as overlay architecture for IP access networks, any communication media that supports IP data transfers on top of it would be a candidate for transporting the signaling and the media flows. IMS also solves issues such as convergence, service creation and delivery, service interconnection and open standards. IMS can allow an operator to retain its existing business models, or evolve towards new ones.

In this thesis, evaluation of access networks is interesting to see how well they are suited to transport IMS services and considered current mobile access network technologies like EDGE ,HSDPA and its extension LTE 4G. IMS is the concept of an Internet Protocol (IP) that enables a variety of services voice, data, and video are connected in the same network.

There are several implicit reasons in this thesis work.

1. PT. Telkom has successfully implement IMS trials in 2010
2. Telkom Group's broadband customer growth increased drastically compared last year by 63.7% to 7.2 million customers in the first half of 2011
3. Telkomsel growth in data traffic increased by 190% until mid 2011 compared to the previous period

1.2 The gap of previous research and the simulation

There are thousands of studies on the IMS network, mainly related to network performance and QoS. In the previous study, the researchers focused on how significant the effect of the tested wireless access on OpenIMS Core software and also the performance of SIP signaling protocol in IMS networks. On the other hand, the growth of the current access technology has developed rapidly, especially with the implementation of the LTE network, the network performance is expected to be better.

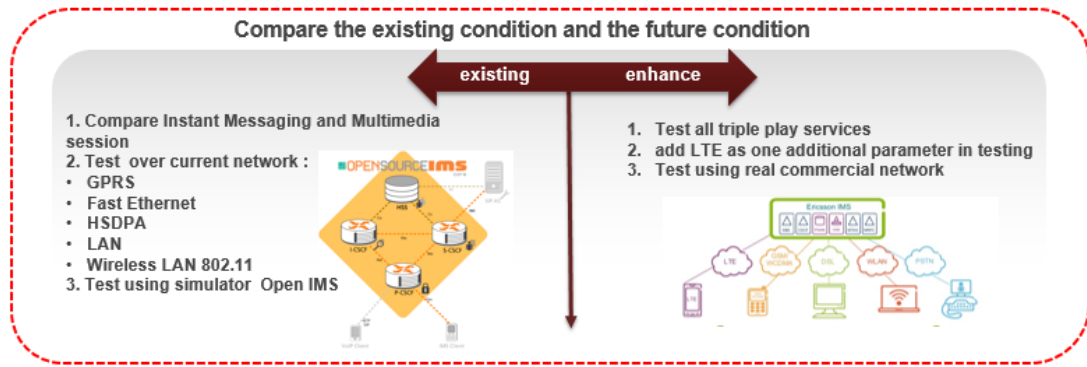


Fig. 1.1 Gap between existing condition with the simulation

In this study, we will be test how well the QoS of the packets at the time of establishing signaling SIP on control plane and RTP-MSRP-H.263-H.264 packets during streaming media. The main difference is that if the first is done by using the simulator, but this simulation performed using the IMS network, and adds real LTE network as one of the test parameters.

1.3 Problem identification

- Previous result shows results of the QoS values depending on the version of the IP protocol, the size of exchanged SIP messages, the number of these messages, and the bit rate of the wireless access link
- Individual experiments on the IMS SIP VOIP has never been measured in LTE 4G network because it is relatively new wireless communication mediums for IMS core network

1.4 Problem Limitation

According to problem identification, this thesis has limitations as follow :

- Due to the limited privileges to change network configuration so that queuing models are not discussed
- Using IMS with Telkom domain as only testing networks
- Between home and visited network using same IMS Core
- Not discuss about optimization
- Performance parameters include the SIP Registration, Call Setup Delay, and QoS Multimedia over triple play services (voice,chat,video).

1.5 Objective

The objectives of this research are:

- Knowing the performance of each wireless access on SIP bearer (control plane) and user plane (multimedia session) on IMS network
- Determine how much influence the access network especially compared to LTE

The analyzed parameters are :

- Delay of SIP REGISTER
- Call Setup Delay
- QoS of multimedia session (throughput, end to end delay, jitter)

In order to analyze the results, here are three types of variable:

1. Dependent variables: latency times, resource utilization and timeout probability
2. Independent variables: number of SIP client/devices, number of links
3. Control variables: network configuration, access network

1.6 Hypotheses

The hypotheses in this research are :

1. LTE would give rich experience of multimedia streaming and give a much better call setup delay
2. The faster of wireless access network, the QoS would be better

1.7 Scope Of Work

The work contains four part activities below :

1. Measure the Triple Play QoS Requirements
 - Latency
 - Jitter
 - Packet Loss
2. Analyze using the following equipment
 - Domain IMS : VPN connectivity to access IMS network
 - Client : 2G/3G/4G Modem, SIP Account integrated, Movial, SIP Phone.
 - Network Analyzer : Wireshark, Trace Generator

3. Obtaining the parameters that run on :

- Wireless LAN 802.11
- EDGE
- HSDPA
- LTE

1.8 Thesis Outline

Chapter 1 : contain basic information of IMS and literature review.

Chapter 2: overview of wireless broadband evolution and VoIP, and explained how it works and factors that affect VoIP quality.

Chapter 3: explain different network session establishment method and then we will introduce the method for session setup in cellular environment

Chapter 4: analyze of simulation result in this chapter.

Chapter 5: conclusion and future work.