ABSTRACT

Universal Mobile Telecommunication System (UMTS) is a technology that gives fast data rates up to 7,2 Megabytes per second (MBps). Besides, UMTS becomes a choice because of its flexibility (wireless) and needs low cost both of costumer and provider. UMTS' high speed can be used to implement video conference. Video conference is a popular service because between users can see each others. In the implementation of video conference, it uses UDP (User Datagram Protocol) where this protocol doesn't give a guarantee that data are rightly arriving to destination. Therefore, quality is a serious problem in video conference implementation.

This final project implements a video conference system using Yahoo! Messenger and using Indosat M2 UMTS network. Theoretically, IM2 gives up to 3,6 Mbps of data rates. All of User Equipment (UE) are in one location and served by one Node B. The distance between Node B and UE approximately 2,8 Km with 4 out of 5 bar signal, 432 kbps uplink data rates and 720 kbps downlink data rates. Video conference quality assessments are using MOS for voice quality where MOS is calculated from delay and packet loss along with PSNR and SSIM to assess the quality of pictures. The analysis is based on picture resolution, download traffic, and number of UEs.

The results of this final project are the usage of 320x240 pixels resolution concern in video quality, while 160x120 pixels resolution concern in voice quality. MOS values downlink are decreasing when download transfer rate and UEs number are increasing. The reason is traffic loads in downlink are increasing. MOS values uplink are stable in level "good enough" for all of video conference sessions because traffic load in uplink are stable. The maximal number of UEs for 320x240 pixels resolution is 4 UEs (PSNR 25,44 dB) and for 160x120 pixels resolution is 3 UE (PSNR 27,26 dB) because PSNR values from both resolutions are above the threshold values (25 dB).

Keywords: UMTS, video conference, E-Model, MOS, PSNR, SSIM