Pembangunan simulasi performa layanan video streaming pada HSDPA

Fauzan, author

Abstrak

Enhanced UMTS Radio Access Netwok Extensions for NS -2 (EURANE) yang dikembangkan oleh SEACORN membawa fase lanjut pada perkembangan simulasi UMTS pada sistem seluler generasi ketiga (3G) yaitu High Speed Downlink Packet Access (HSDPA). Sistem selular 3G didesain untuk dapat membawa berbagai jenis paket multimedia melalui jaringan IP (IP-based) sehingga interkoneksinya dengan fixed network dimana mayoritas layanan multimedia ditawarkan oleh provider pun akan menjadi lebih mudah. Video streaming merupakan salah satu layanan multimedia yang mengizinkan user untuk berkomunikasi melalui transmisi audio-video dua arah secara real-time dan simultan.
Untuk memperoleh kualitas video streaming yang balk, dilakukan simulasi pengukuran performa. Performa kualitas layanan video streaming tidak pernah terlepas dari parameter QoS seperti throughput, packet loss rate, packet delay, atau packet jitter. Di samping itu perlu juga diukur evaluasi kualitas video secara subyektif berdasarkan perbandingan tampilan video sumber dan video yang diterima frame demi frame melalui perhitungan Peak Signal to Noise Ratio (PSNR) dan Mean Opinion Score (MOS).
Pada tesis ini penulis melakukan pembangunan simulasi performa layanan video streaming dengan menggunakan teknologi HSDPA pada jaringan UMTS berdasarkan 3 user environment, yaitu indoor, pedestrian, dan vehicular.
Metode penelitian yang dilakukan adalah dengan membangun simulasi menggunakan aplikasi Network Simulator (NS 2) versi 2.30 yang berjalan diatas operating system Fedora Core 7 berbasis Kernel 2.6 dan tambahan patch Enhanced UMTS Radio Access Network Extensions for NS -2 (EURANE) versi 1.60 yang dikembangkan oleh IST-SEACORN (Simulation of Enhanced UMTS Access and Core Network) dan modul Evaluation Video (EvalVid) yang dikembangkan oleh Technical University of Berlin, Telecommunication Network (TIKN). Hasil output akhir pada NS-2 akan divisualisasikan berupa grafik dan tabel yang kemudian akan dianalisa lebih lanjut yaitu berupa pengukuran throughput, packet loss, delay, PSNR, dan MOS.
.....Enhanced UMTS Radio Access Network Extensions for NS-2 (EURANE) developed by SEACORN has brought us to the higher phase of UMTS simulation in third generation (3G) wireless telecommunication system, which is High Speed Downlink Packet Access (HSDPA). Wireless 3G is designed to deliver various kind of multimedia package through an IP network so that its interconnection with fixed network where most of multimedia services offered by provider become easier. Video streaming is one of those multimedia services which allow user to communicate through two-way real-time audio-video transmission simultaneously.
To achieve the good quality of video streaming, the measurement of performance simulation should be done. Video streaming services are always connected with QoS parameter such as throughput, packet loss rate, packet delay, or packet jitter. Besides, subjective video quality evaluation is also needed based on comparison between source video and receiving video by using Peak Signal to Noise Ratio (PSNR) and Mean Opinion Score (MOS) calculation.

In this thesis, the author is developing a simulation of video streaming service for HSDPA technology over UMTS network based on 3 user environments, such as indoor, pedestrian, and vehicular.
The research method is by developing simulation using Network Simulator (NS-2) application version 2.30 running at operating system Fedora Core 7, Kernel 2.6 based and Enhanced UMTS Radio Access Network Extensions for NS-2 (EURANE) addition patch version 1.6 developed by SEACORN (Simulation of Enhanced UMTS Access and Core Network) and Evaluation Video (EvalVid) module developed by Technical University of Berlin, Telecommunication Network (TKN). This simulation development will perform output graphics and measurement of throughput, packet loss, delay, PSNR and MOS.