ERROR ROBUSTNESS EVALUATION OF HIGH QUALITY H.264/AVC BROADCAST SERVICES OVER RTP/IP USING NETWORK EMULATION

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ABSTRACT

Streaming media services delivered over IP networks are gaining popularity and momentum, and consumers show an increased interest in being able to play and enjoy their media wherever they are. The ever increasing deployment of high speed wired and wireless Internet access networks, and continuous development of more efficient compression schemes for audio and video, are two of many important factors that enable content and service providers to deliver higher quality IP-based multimedia services to end-users.

The goal of any multimedia communication system obviously should be to maximize the end-user's perceived quality of the delivered service. However, to measure the end-user perception of an audiovisual service quality, or similarly, to which extent they react objectionable to distortions introduced by compression and packet-switched transmission, is extremely difficult and depends on factors that are not easily modeled (e.g. human diversity, preferences and application knowledge). Still, to this end, VQEG (Video Quality Experts Group) [1] is currently working towards a standardization of quality metrics that could be employed by multimedia streaming applications.

In this paper,[1] we will present an evaluation of the performance and error resilience of RTP-based broadcast streaming of high quality H.264/AVC video. Using the test bed described in [2] we transmit High-Definition 720p video over a test network, and use an IP network emulator to introduce a varying amount of randomly distributed packet loss. For monitoring and capturing the video packet flow we use DAG network interface monitoring cards [3] together with MAPI [4].

Due to both the complexity involved in real-time decoding of High-Definition H.264/AVC, and because of the current limitation in available real-time decoding software supporting the advanced error resilience tools available in H.264/AVC Extended Profile, packet reception and decoding is done offline. Packets are sequentially read from a trace file, and each NAL Unit is assembled according to RFC 3984 [5]. NAL Units which are correctly received are then written to an H.264/AVC Annex B bitstream file, while corrupted NAL Units are discarded. Finally, decoding of the received bitstream is done using the H.264/AVC reference software [6]. Figure 1 depicts the test setup.

The final paper will present results that indicate the reconstructed video quality using PSNR when employing different error resilience tools of the Extended Profile tool set, e.g. slice partitioning, data partitioning and flexible macroblock ordering [7], for different packet loss rates. Typical results will be demonstrated at the seminar.

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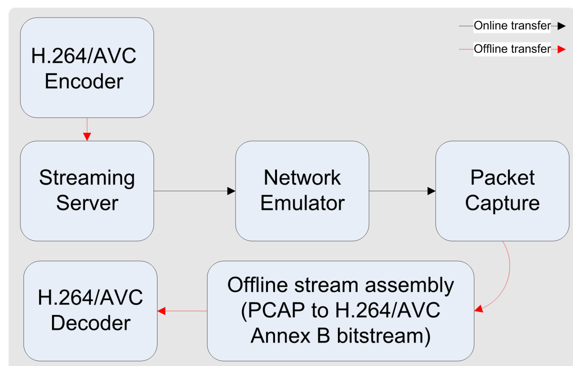

Fig. 1. Test setup.

1. REFERENCES

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