

A Framework for Adaptive Streaming of MPEG-4 Video

Nick Feamster Deepak Bansal
 Advisor: Prof. Hari Balakrishnan

Motivation

- Rising demand for streaming media on the Internet
- Need an open system which supports congestion control and selective reliability
- Losses in interframe compression schemes result in propagation of errors

Approach

Selective Loss Recovery

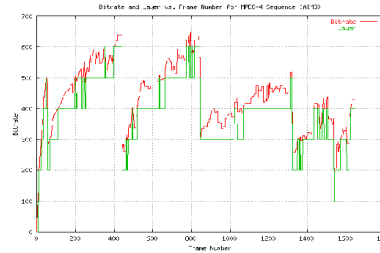
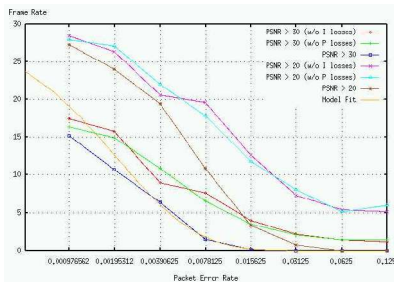
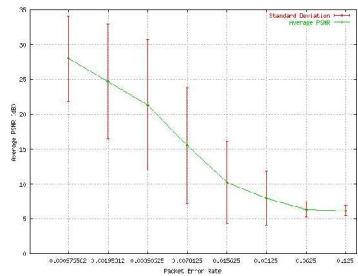
- Loss of reference frame data dramatically reduces PSNR
- RTP-compatible extensions provide semantics for:
 - Detecting lost portions of bitstream and request for retransmission

Congestion Control

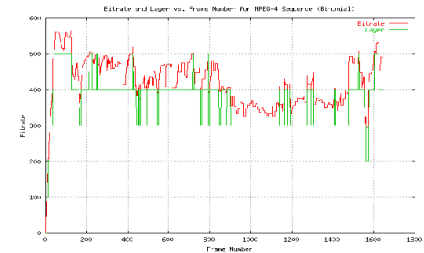
- TCP's AIMD policy results in large rate oscillation: need smoother congestion control
- Allow the application to make the appropriate congestion control decisions

Results

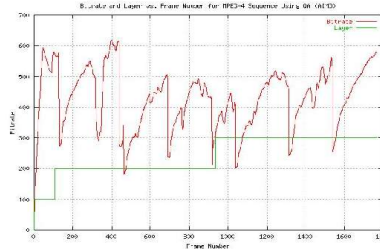
- Selective retransmission allows for the recovery of most important data and limit propagation of errors.
- Binomial congestion control reduces layer switching and achieves smoother rate than AIMD:
 - Better perceptual quality
 - Lower buffering requirement for more timely delivery
- Results can be applied to both simulcast and hierarchical encodings



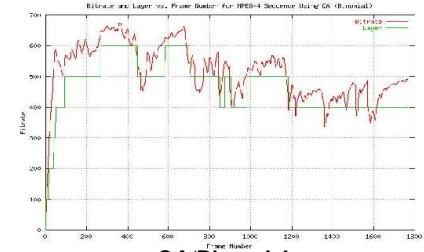
Simulcast/AIMD



Simulcast/Binomial



QA/AIMD



QA/Binomial

