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Content-Aware Adaptive Video Streaming System

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Abstract: Since there are no Quality of Service QoS guarantees for video streaming over best-effort IP networks, adaptation for both the audio and video streams of an established real-time streaming session must be applied to respond to network congestion conditions. In many video streaming applications, either the audio or the video stream for the same audio/video streamed content is more semantically important than the other. Hence it is better to let this stream, in cases of congestion, suffers less degradation in quality even if that imposed the other stream to suffer more degradation. This paper proposes a simple but efficient application-level content aware adaptive video streaming system that is primarily configured by the previously noted more semantically important stream. The system monitors the end-to-end network congestion level. In congestion cases the system degrades in steps the quality of the less important stream first. Then it moves, if necessary, to the other stream to degrade, according to a predefined adaptation mechanism. The system then triggers when the congestion case is over in order to start upgrading the degraded streams gradually back to their initially established states if the network conditions permit. This new concept in adaptation, when tested, lead video streaming applications users to be more satisfied with Internet video streaming services.
Keywords: Best-Effort, QoS, RTP, Video Streaming

1. INTRODUCTION

With the rapid advances in computer and network technologies, especially with the emergence of Internet, audio/video streaming applications are becoming very popular. Most importantly the low cost of using computer besides the recent progress of broadband access