Introduction

Goals
• To evaluate the suitability of opportunistic resources for on-demand processing of multimedia streams
• To design, implement and evaluate a proof-of-concept application that performs on-demand multimedia transcoding for mobile devices using opportunistic resources

State of the Art
• Context aware applications and platforms are available for delivering optimized content according to each client’s capabilities
• Grid resources have been used in the past to support on-demand transcoding

Transcoding Architectures

• Pre-transcoding
• Server-side transcoding
• Client-side transcoding
• Transcoding in the network using fixed resources
• Transcoding in the network using opportunistic resources

Supporting Protocols and Tools

• Condor, for resource management
• RTSP/RTP, for session control and stream transport
• VLC, for transcoding, rendering and RTSP support
• Condor Problem Solver
  • Application built on top of Condor
  • Implement application-specific resource management using Condor primitives
• Python API allows programatic control of VLC
• By using the python API to create a “wrapper” for VLC, support for the RTSP protocol can be expanded

Evaluation

• Initialisation of on-demand transcoding session
  • Pre-transcoded: 2.52 sec
  • Transcoding: 2.61 sec
  • Video Condor: 3.92 sec
  • Overhead added by Video Condor: 1.31 sec
  • Migration of transcoding session
    • Occurs when an opportunistic resource becomes unavailable and a new resource must be used
    • 4.8 second interruption in receipt of RTP packets
    • May be eliminated using asynchronous sessions

Conclusions

• A proof-of-concept application that performs on-demand transcoding of streams to cater for heterogeneous mobile client characteristics has been developed
• On-demand multimedia transcoding can be performed using opportunistic resources provided by Condor
• Latency of session initialization and transcoder migration have been evaluated

Further Information

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