DVRTP preview program with OpenGL

Multiple platform support

- Tsuyoshi Hisamatsu
- Postxdvshow
- High rendering performance
- Enable hardware accelerator
- DVTS + FEC ready
- Gldvshow has released http://www.sfc.wide.ad.jp/DVTS/software/gldvshow/

Support platform
- Linux
- X11+OpenGL
- MacOSX
- No audio

DVTS + FEC ready

- MPEG2-H.264 Real-time transcoder(*)

(*) This work is partially supported by National Institute of Information and Communications Technology (NICT), Japan.

Diversified infrastructures and clients

- Infrastructure
  - Optical fiber, CATV, ADSL
  - 802.11, HSDPA, WiMAX
- Clients
  - PC, STB
  - Mobile Phone, PDA, iPhone

Former our approaches for service gap(1/2)

- Framerate control
  - Ex. > DVTS
  - Frameskipping
  - Required computer resource: low
- Format dependent
  - Cannot use intraframe compression
  - Ex. > MPEG 2, H.264
- Inefficient bandwidth control: video quality
  - Ex. > DVTS
  - 30fps: 32Mbps
  - 15fps: 17Mbps
Former our approaches for service gap(2/2)

- Hierarchical data structure
  - Data are divided into several layers.
  - Layer is multimedia data unit.
  - Video quality control selecting the number of accepting layers.

- Multicast tree structure
  - Data are delivered with IP multicast.
  - Senders provide maximum quality data.
  - Intermediates nodes decrease layers to send adapting to the network resource.

Difficult to reconstruct movie from different streams.

New our approach

- Transcoding
  - Conversion from one code to another.
  - Contents format.
  - Contents bitrate.

Most adaptive approach for service gap.

Design

Transcoding Engine

- Mpeg2-AVC/RT Video Encoder SDK
- Human Monitoring

Output format:

- 10 Kbps - 100 Mbps CBR/VBR
- H.264 stream format
- Direct Show filter

In this research, we use this engine as MPEG2-H.264 converter.

Implementation

<table>
<thead>
<tr>
<th>OS</th>
<th>Windows Vista</th>
</tr>
</thead>
<tbody>
<tr>
<td>Implementation environment</td>
<td>Visual Studio 2008</td>
</tr>
<tr>
<td>CPU</td>
<td>Intel Xeon CPU 2.00GHz (Dual)</td>
</tr>
<tr>
<td>Memory</td>
<td>4.00GB</td>
</tr>
<tr>
<td>Ethernet</td>
<td>1000BASE-T</td>
</tr>
</tbody>
</table>

Future work(1/2)

- Evaluation
  - Scalability
  - Transmission delay

- Dynamic control
  - State variation
  - Dynamic bit-rate control
  - Tree control

Change one transcoding to another.
Future work (2/2)

- Dynamic receivers control
- Transcoder's selection criteria
- Transported contents format
- Transported contents bit-rate
- Transcoder's computer resources
- Available network bandwidth
- Transport delay and jitter

Appropriate stream route

Contents Provider

Transcoders

Direct MPEG 2 8Mbps

H.264 2Mbps