Add Multimedia To PDFs and Audio and Video Codecs

Raphael Mueller
Agenda

• Add Multimedia to PDFs
  – Why Embedding?
  – Embedding Explained
  – Restrictions

• Audio and Video Codecs
  – Containers
  – Codecs
  – Containers & Codecs Summary
  – Adobe
  – HTML5
  – Proposal
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  – Containers
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  – Containers & Codecs
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Why Embedding?

• More and more presentations contain multimedia material like simulations or video recordings
• These presentations loose a lot of their content if the videos are not contained
• With Acrobat 9 embedding of videos got a lot easier if videos comply with (Adobe) specifications
Embedding can be accessed either through the menu „Tools“ → „Multimedia“ or the Toolbar. After selecting the type of content we simply draw a rectangle with the mouse.
If the video format/codec is recognized by Acrobat we can press „Ok“ and see the video embedded into the PDF.
There are also advanced options available that set conditions e.g. „Start the video when ...“, „Playback in own window“ etc.
Restrictions

• The Video and Audio stream have to comply with a certain format / codec
  – „All multimedia that is developed in Flash® as well as multimedia that is H.264 compliant can be played back in Adobe Reader® 9 and later. (H.264, also known as MPEG-4 part 10, is a video compression standard that provides high quality video without substantially increasing file size.) Video files of varying formats and filename extensions can be H.264 compliant.“
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Containers (1)

- "The container file is used to identify and interleave different data types. Simpler container formats can contain different types of audio formats, while more advanced container formats can support multiple audio and video streams, subtitles, chapter-information, and meta-data (tags) — along with the synchronization information needed to play back the various streams together."
Containers (2)

• Examples for container formats
  – AVI (Windows Standard) Microsoft
  – FLV (Flash) Adobe
  – MKV Matroska.org
  – MP4 (based on ISO Standard) ISO
  – OGG Xiph.org
  – MOV (Quick Time File Format) Apple

• The type of content does not follow from the type of container
## Container (3)

### Container – MyMatroskaFile.mkv

- Video Track 1 (censored version)
- Video Track 2 (uncensored version)
- Video Track 3 (comments by the director)
- Audio Track 1 (language A)
- Audio Track 2 (language B)
- Subtitle Track 1 (language A)
- Subtitle Track 2 (language B)
Codecs (1)

- "A codec is a device or computer program capable of encoding and/or decoding a digital data stream or signal."

- Examples for Audio codecs (and how they are described on the packaging of audio players)
  - Free Lossless Audio Codec (FLAC)
  - Microsoft "WAVE" (WAV)
  - MPEG-2 Audio Layer III (MP3)
  - Vorbis (OGG)
  - Windows Media Audio (WMA)
  - Advanced Audio Coding (AAC)
Codecs (2)

- Examples for Video codecs (and manufacturer or stakeholder)
  - DivX (DivX, Inc.)
  - Xvid (Xvid.org)
  - Theora (Xiph.org)
  - Windows Media Video (Microsoft)
**Codecs (3) in a container**

<table>
<thead>
<tr>
<th>Container – MyMatroskaFile.mkv</th>
</tr>
</thead>
<tbody>
<tr>
<td>Video Track 1 (Vorbis)</td>
</tr>
<tr>
<td>Video Track 2 (H.264)</td>
</tr>
<tr>
<td>Video Track 3 (H.264)</td>
</tr>
<tr>
<td>Audio Track 1 (MP3)</td>
</tr>
<tr>
<td>Audio Track 2 (AAC)</td>
</tr>
<tr>
<td>Subtitle Track 1 (Time &amp; Text)</td>
</tr>
<tr>
<td>Subtitle Track 2 (Time &amp; Text)</td>
</tr>
</tbody>
</table>
Containers & Codecs
Summary

• Audio and Video is encoded by codecs into a data stream
• These data streams can be placed in a container
• For each program one has to check individually which containers it supports and which codecs it supports
• Speakers come up with different codecs. This complicates speaker preparation and presentation management a lot
### Adobe

**Supported containers and codecs (Acrobat 9)**

<table>
<thead>
<tr>
<th>Format</th>
<th>Transcoding¹</th>
<th>URL streaming²</th>
<th>Direct placement without transcoding²</th>
<th>Legacy placement³</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flash Video (.flv)</td>
<td>N/A</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Microsoft AVI (.avi)</td>
<td>Yes</td>
<td>No</td>
<td>Yes, if H.264 encoded</td>
<td>Yes</td>
</tr>
<tr>
<td>QuickTime Movie (.mov)</td>
<td>Yes</td>
<td>No</td>
<td>Yes, if H.264 encoded</td>
<td>Yes</td>
</tr>
<tr>
<td>MPEG (.mp4, .m4v, .mpeg, .mpg)</td>
<td>Yes</td>
<td>Yes (.mp4 only)</td>
<td>Yes, If H.264 encoded</td>
<td>Yes (except .m4v)</td>
</tr>
<tr>
<td>Shockwave Flash (.swf)</td>
<td>N/A</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Windows Media (.wmv)</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Advanced Streaming Format (.asf)</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>3GPP Movie (.3gp)</td>
<td>Yes</td>
<td>No</td>
<td>Yes, if H.264 encoded</td>
<td>No</td>
</tr>
<tr>
<td>RealMedia (.ram)</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
</tr>
</tbody>
</table>

¹ Transcoding of video for direct playback in Adobe Reader 9 is supported in Acrobat 9 Pro Extended only.

² Direct placement without transcoding is supported in both Acrobat 9 Pro and Acrobat 9 Pro Extended.

³ Playback is compatible with earlier versions of Adobe Reader, but requires that a compatible multimedia player is available when viewing.
- `<audio> <video>` tags
- Currently, there are 3 video formats supported by main browsers for the video element:

<table>
<thead>
<tr>
<th>Format</th>
<th>IE</th>
<th>Firefox</th>
<th>Opera</th>
<th>Chrome</th>
<th>Safari</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ogg</td>
<td>No</td>
<td>3.5+</td>
<td>10.5+</td>
<td>5.0+</td>
<td>No</td>
</tr>
<tr>
<td>MPEG4</td>
<td>9.0+</td>
<td>No</td>
<td>No</td>
<td>5.0+</td>
<td>3.0+</td>
</tr>
<tr>
<td>WebM</td>
<td>No</td>
<td>4.0+</td>
<td>10.6+</td>
<td>6.0+</td>
<td>No</td>
</tr>
</tbody>
</table>

Ogg = Ogg files with Theora video codec and Vorbis audio codec
MPEG4 = MPEG 4 files with H.264 video codec and AAC audio codec
WebM = WebM files with VP8 video codec and Vorbis audio codec
 Proposal (1)

• We start to officially support some codecs
  – Speakers who deliver their movies using these codecs can be sure that they can be played and processed
  – Speaker preparation and presentation management have an easier life
  – We can focus our tools toward these codecs
Proposal (2)

- Support a set of containers and codecs directly supported by Acrobat 9
  - .avi, .mov, .mp4 containers
  - H264 Video with AAC or MP3 Audio
- Support a license free open source standard
  - Ogg container
  - Theora Video with Vorbis Audio
Questions?
• Add multimedia to PDFs

• Big Buck Bunny
  http://www.bigbuckbunny.org

• Container format (digital)
  http://en.wikipedia.org/wiki/Container_format_%28digital%29

• Codec
  http://de.wikipedia.org/wiki/Codec
References (2)

- Supported file formats | Acrobat, Reader
  http://kb2.adobe.com/cps/405/kb405848.html

- Transcode – VideoLAN Wiki
  http://wiki.videolan.org/Transcode