

Encoding Tools and Techniques for Video Podcasting

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The Goal

Deliver your video content to the consumer with acceptable:

- Quality
- Download Time
- Compatibility

The Problems

- **Interlacing:** Computers have progressive displays
- **Color:** Digitized NTSC looks washed out on computers
- **Size:** Raw video is way too big for internet transfer
- **Pixel Aspect Ratio:** Digitized NTSC has rectangular pixels. Computers have square pixels.

Compression Demystified

- Lossy vs. Lossless
- Perceptual compression
 - Based on color and motion for video
- Tradeoff: potential artifacts
- Codec = compression/decompression algorithm

The Encoding Process

1. Choose Resolution
2. Choose Frame Rate
3. Choose Bit Rate
4. Choose Codec
5. Choose File Format

Resolution

Most important decision that affects size of the file

- Higher bit rate allows higher resolution but produces bigger files
- iPod: 320x240
- AppleTV: 640x480
- Web streaming: 640x480

Resolution Rules of Thumb

128 kbps :: 240x180

300 kbps :: 320x240

500 kbps :: 640x480

Frame Rate

- Less frames = more bits for each frame = better quality video
- Depends on how much motion you have
- Try cutting to 15-20 frames/sec

Bit Rate

- Average broadband connection supports 300 kbps
- Affects download/stream time
- How fast can they experience your content?

Audio Bit Rate

- A portion of the total bit rate
- 32 – 64 kbps
- 10 - 20 % of total bit rate
- Audio is important to the experience
- Codec: probably use default

Codecs

- H.264
 - MPEG4 standard; supported by the iPod
- Windows Media Video
- Real Video

Formats

- **QuickTime:** pretty universally supported; iPod & iTunes
- **Windows Media:** supported on all PCs
- **Real Media:** becoming popular on cell phones
- **Flash:** widely supported; good for streaming

How Many Formats

Want to cover your bases?

- Quicktime H.264
 - 320x240 for iPod
 - 640x480 for AppleTV
- Flash
 - 640x480 for web
- WMV
 - for PCs and other portable players

How Many Formats

Not practical to do all of them:

- Production time
- Storage
- Bandwidth
- Split feeds

De-Interlacing

- Only needed above 320x240
- Many encoders have a filter

Color Correction

We need to make the color more vivid
without changing the black and
white levels

Color Correction

Option 1: Encoder Presets

- NTSC to RGB Color
- Studio RGB to Computer RGB

Option 2

- Adjust Gamma

Color Correction

Option 3:

- Bump up contrast
- Bump up color/saturation
- Reduce brightness to compensate

Two Pass & VBR

- CBR = constant bit rate
- VBR = variable bit rate
- Two pass allows us to economize the bit rate according to the complexity of the frames
- Try it and test
- Can cause streaming problems

Encoding Tools

- Quicktime Pro
- Windows Media
- Flip4Mac
- Sorenson Squeeze
- Adobe Flash

AppleTV

- Increase the resolution to either 640x480 or 640x360 (depending on the aspect ratio)
- QuickTime 7.1's "Export to iPod" function will ensure that a video file is encoded at a width of 640
- If your source files are 16:9, stick with that aspect ratio

iTunes Podcast Tech Spec

<http://www.apple.com/itunes/store/podcaststechsspecs.html>

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