FOSS in Broadcast

Kieran Kunhya

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Why such little use of FOSS in broadcast?

• Worse than days of Wintel dominance in the server room
  – Broadcast has large budgets and prefers big engineering solutions
  – A history of using hardware from the analogue days – some broadcast engineers don’t like computers
• The majority of consumer devices and some professional hardware uses Linux and other FOSS but does not expose it to the end-user.
So what’s the upside?

• Broadcast chain is segmented so FOSS applications can be slotted in place
• Convergence with the IT industry so more use of IT standards
  – IPTV is more aware of FOSS than “traditional” broadcasting
• Passionate and dedicated FOSS enthusiasts who make things happen
Social Aspects (1)

- FOSS has been good at making **tools** that fit well with the UNIX philosophy. In broadcast, where **shinystuff™** wins.
- Market segmentation leads to preconceptions about product based on features and price.
- Again, finding the right people (usually in small/mid-sized broadcasters) who can push FOSS adoption.
Social Aspects (2)

• FOSS must fit around commercial/technical restrictions – people will not rebuild their broadcast chain or make major day-to-day changes.

• Requires dictatorial attitude in order to avoid catering for every persons niche case and becoming a “jack of all trades, master of none” – less is more
Some current FOSS projects in broadcast

• CasparCG
  – Production graphics system created by SVT (Swedish TV) and used 24/7.

• Dirac
  – Created by the BBC as a production codec and used in the Beijing Olympics
  – Fair to say not as successful technically or commercially as it could have been
Open Broadcast Encoder (1)

- There have been a couple of in-house FOSS broadcast encoders
- Built on the x264 encoder, used all over in Blu-Ray (Warner), web (Youtube/Facebook) etc.
- Lacked the “head and tail”
- In collaboration with various broadcasters, set out to build a top-end broadcast encoder usable on commodity hardware. Top-end encoders are around $50k for HD.
Open Broadcast Encoder (2)

• Developed on production broadcast chains
  – In some cases video sent all the way to the home
  – More resources at disposal than proprietary rivals
• Fits into current broadcast use-cases
  – “Distribution” encoding to the home
  – “Contribution” encoding from e.g. sports ground to control room (high bitrate)
  – Low-latency (~200ms) encoding for interviews
Technical Stuff

• OBE is Linux only for now, though much use of POSIX HR clocks
  – May start using kernel APIs for timed packet release to have near-zero jitter
• x264 and ffmpeg/libav have heavy use of x86 and ARM SIMD. GCI students (highschoolers) have written SIMD in the last two years.
• Transparent Huge Pages are an easy optimisation but don’t work (help?)
  – THPs for file based mmaps if it comes?
• TODO: Other x264 optimisations, a good AAC encoder etc
Why not VLC/Gstreamer etc...?

• Many hacks required to implement broadcast features that 99.9% don’t care about.
  – Enough hacks in consumer formats already.
• Psychology – VLC is **too successful** and is associated as a tool to get routine things done and not for high-end broadcast.
• OBE tries to return as much code as possible to FFmpeg/libav (e.g swscale optimisations, lxf demux).
• Regrettable that there has to be some work duplication but are proud to be standing on the shoulders of giants
Patents? Theora/VP8? etc

- Patent royalties left to the broadcaster to deal with since OBE is (almost-always) source-code only distributed.
- Patents could be a source of FUD in the future though it is only Dolby that refuses to license to FOSS (breaking terms of RAND licensing)
- Lots of people ask about Theora/VP8 etc. The answer is simple – They’re not used in broadcast and almost certainly will not ever be. There was probably a window of opportunity for Vorbis many years ago. Possibility for Opus but development is very internet focused.
A special announcement

• This week Norwegian community TV station Frikanalen has just launched what we believe to be the first long-term Digital Terrestrial channel encoded with FOSS.
Any questions?

• Come and speak to me afterwards
• Email me at kierank@ob-encoder.com