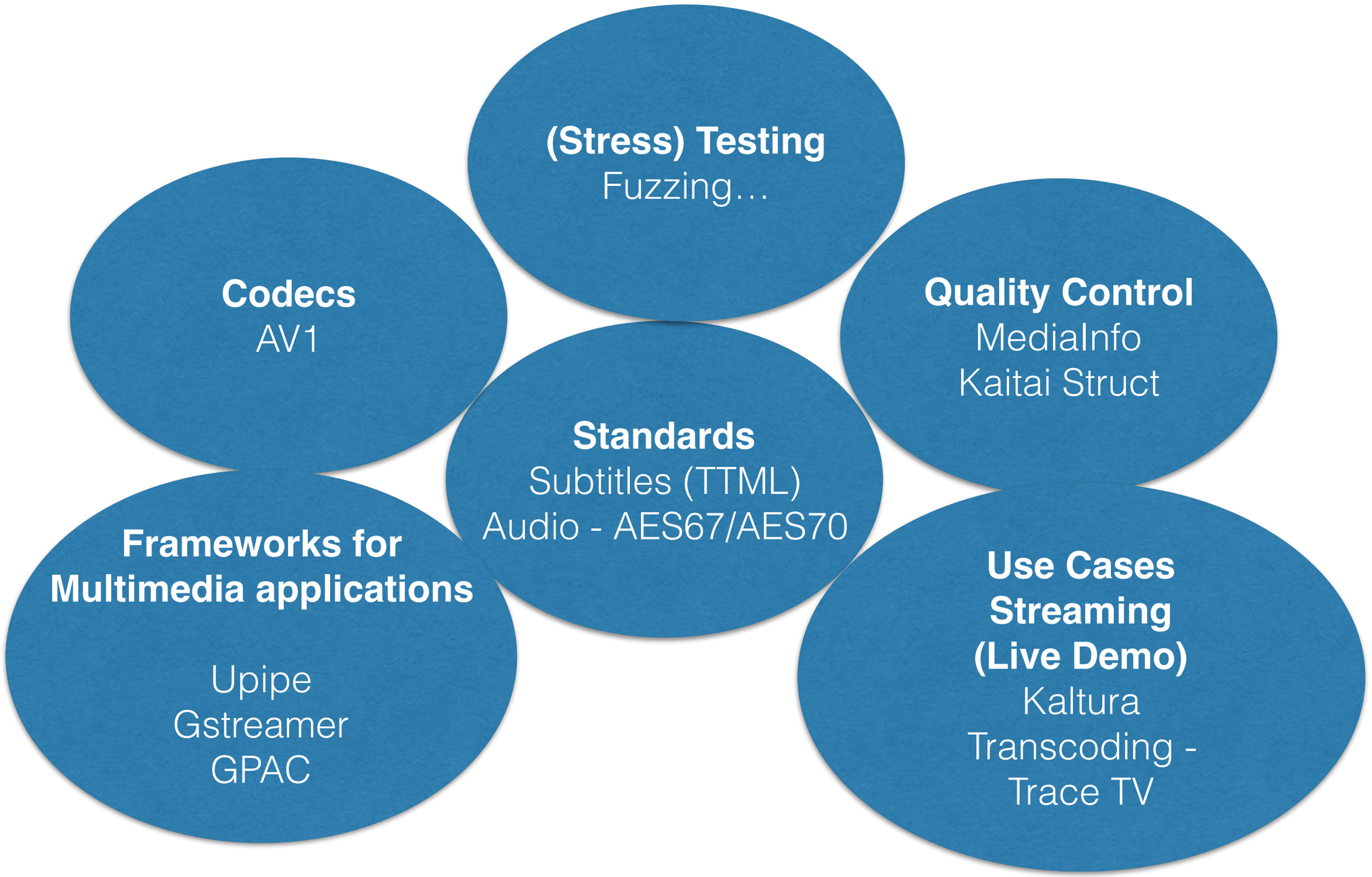
FOSDEM'17
OPEN MEDIA
DEV ROOM

Review and Wrap Up !

A. Kouadio - EBU

This year's Topics



KALTURA - 10 Years open source innovation.

- 10 years of open source innovation in online video delivery
- **KALTURA** - End to End VOD and live Media management platform
- Kaltura start in 2006 following youtube UGC cultural change.
- Primary Goal : youtube meets wikipedia ! Missing collaborative video editing platform
- 2008/9 Open video alliance created to provide open video standards especially html5 >video>
- Video starts catching up in education - html5 takes shares in flash adoption
- 2009 - variety of video sources. rich metadata attached to the contributed videos. how to handle these large sets of videos.
- 2012 - major support from Apple on HTML5 and ban on Flash by steve jobs.
    - Early deployments in Moocs and basic video delivery - Growth in telemedicine and healthcare -
- **Next steps**
    - New player / realtime video delivery
    - VR / 360 support / Quicker app deployment.

KALTURA: Using NGINX RTMP and Kaltura platform

- Live demo of video stream supporting DASH And HLS performed by Jess Pornoy from Kaltura.
  - RTMP over SSL could be used to enforce stream encryption.
- Streaming done over RTMP and playback over HLS
- Kaltura-Nginx best choice for Kaltura as NGINX web server used across the company - also recommended if you want to use RTMP . For WEB RTC there are other solutions available (e.g. Mediasoup).

IRT - **T**imed **T**ext **M**arkup **L**anguage Subtitles support in OS SW

- **Andreas Tai - IRT**
- **W3C standard** - started in 2003, 2nd Edition in 2013
    - SMPTE TT disappearing , (EBU-TTD) **IMSC1 is the most promising subtitling profile for web delivery**.
    - TTML is not yet widely supported by browsers mainly WebVTT but TTML is supported by most video players as it is preferred by content producers
- **Where is TTML supported ?**
    - Production : SubtitleEdit
        - Amara - FanSub community : online subtile editor., Subtitle Conversion Framework (opensource project for subtitle archiving and transport of subtitles.) supports :
        - TTT (timetext toolkit) and EBU-tt-live-toolkit. support streaming of subtitles and pushed by BBC.
    - For Distribution : MP4Box supports TTML
        - Presentation : VLC player latest version support TT-ML may need to support more features such that color styling and need to rename the subtitle file into .txt.
- **Broad support of TTML through OSS project**.
- Open for comments and bug reports. all supporting tools are listed in the presentation.

TRACETV - Transcoding platform with OS tools

- **Trace TV - Emmanuel Aldegguer** -(20 Production center in the world)
- Transcoding platform based on open source tools (FFMPEG, Node.js, Jquery, etc).
    - Web interface uses PIPE and Script to run an FFMPEG task.
    - Created to **address the general need for most employees to transcode files without knowing the technical details of each formats and codecs**. Main users community managers and broadcast production.
    - High level simple language and tracking web interface.
    - Less advanced that professional platforms.
    - Not a distributed transcoder, Small virtual machine are used of each transcoding task.
- Source content are not contributed in the correct formats and need a thorough QC check.
- **Next steps :**
    - **share with the community (.git) and improve duplication of the platform.**

Gstreamer - Status update

- **Sebastian Dröge** - http://gstreamer.freedesktop.org
- **Gstreamer** : **pipeline based multimedia framework and dynamically reconfigurable** (while data is flowing).
- **Goal** : make it easy to build complex multimedia applications via a simple core framework, easy to integrate in other applications. Very stable API.
    - Community driven OS project - LGPLv2.1 proprietary software can be built on top. written in C bindings for Java, Go, python etc… exist.
- **Clarifying The Confusion** : it is Not a codec a streaming server / transcoder / codec etc…
- Current Version 1.12 -
    - Device probing available (lists device capabilities etc…)
    - Codec support (H.265 / VP9 / etc…) major OPUS improvements. support for TTML.
    - Support of live mixing and mixing of live sources. used in professional broadcast products.
    - Major Video rendering API's supports (wayland, Vulkan, GL, etc…)
    - WebRTP (hot topic) supported. with remote clock sychronization.
    - New build system for Gstreamer (Meson - replacing Autotools).
- **Next steps** - merge GstTranscoder and integrate openCV, **support for SDI over IP.**

GPAC for VR and 360 video delivery - A. R. Sekkat

- GPAC - open source multimédia framework - LGPL licence
  - **MP4Box** - file segmentation, encryption and procession for DASH Streaming.
  - **MP4Client** - support for VR/360 video.
- 4K image format for be streamed, therefore need efficient bandwidth management
  - **Tile the image and transmit different qualities for each tile depending on the one in view.**
- Different quality degradation strategies are possible as there are no standards available.
  - Current **MP4Box supports different Tiling quality strategies** that allowed graceful quality improvement of the picture in view

UPIPE - status update.

- C pipeline based multimedia Framework, started in 2012 growing fast ! funded by OpenHeadEnd.
    - Focus of broadcast and professional applications.
    - mostly MIT licensing and some modules in LGPL.
- **What's New ?**
    - TS compliant according to the packet delivery constraints / HLS client / H.265 / VANC support in SDI etc… **LUA Bindings**. AES encryption available as well as https.
- UPiPe inputs for broadcast
    - support for main PCIe ASI cards - Decklink/DVEO
- Native Support for v210 (10bit Video format) and EBU R128 among others.
- **Important** - Upipe Framers (similar to AVcodec parsers)
    - act as bitstream filters to reshape streams.
    - Dynamic changes :propagation of stream threads.
    - Efficient threading : you decide where to allocate your threads.
- Use cases (some of them are available on the
    - Video Player 1 / TS Remux / Recording / Mosaic (one pipeline per input) / live encoder/decoder / transcoder /MPTS mix

MediaInfo - Media file quality control.

- **Jerome Martinez - jerome@mediaarea.net - @mediaarea_net**
- mediaArea.net
- Different media community needs to be address - Fix incorrect metadata in source files and perform QC on decoded content and verify conformance.
- **MediaInfo** - **Metadata extraction and review tool** developed by mediaArea.
    - BSD2 License / 6K downloads per day.
    - Detect all « weird » transport layer. for individual and professional usage.
    - supports IMF and distribution formats such matroska etc…
    - Allows export of metadata in different professional metadata frameworks (PBcore, EBUCore etc.)
- **MediaConch - File Conformance checker** (GPLv2 and MPLv2 License). support FFV1, Matroska and PCM by default
    - can be extended with plugins (pdf, tiff) for report generation.
- **MediaTrace** (under development)
    - Deep check of bytes i.e. provide a meaning for each byte in the bitstream
- **QCTools** - based on FFMpeg (GUI) to **perform quality control on the decoded based band signal** (PSNR / SSIM etc..)

KAITAI Struct - file parser

- **Issue** : multitude of more complex file formats not necessarily well documented. parsing binary files is difficult
- **Mission** : Create a human readable description of the file format by parsing the file binary.
    - Dumping tools embeded by developers for debugging purposes.
    - Errors in file format library can be used as vulnerability for DoS errors or information leaks.
    - No Wireshark for file format library debugging. at least universally accepted
- Kaitai Struct - Declarative file format specification language.(.ksy)
- **Workshop on KAITAI struct** to be arranged if growing interest contact :
    - http://kaitai.io/
    - Twitter: @kaitai_io

AV1 - a new codec

- **Rostislav Pehlinavov** - Creator of Dalla codec.
- **AV1 Codec**
- First codec of **Alliance of Open Media** - Consortium of large internet video streaming companies
    - **Royalty free** - optimized for the internet supported by many companies (Amazon, Netflix etc…) - Still contains some IP - trying to bypass these with new clever tricks.
- Reference encoder based on libvpx (without)
    - **Currently assessing the different coding tools** that will contribute to the optimal performance of the codec (while avoid IP).
        - all tools are assess in experiments before addition to the codec. (50 currently ongoing. example Deringing filter import from Dalla or PVQ tool…
    - **Bitstream to be frozen Q4/2017** (maybe?).
    - Currently better than H.265 around several metrics (PSNR /SSIM / etc…)
- ***Something to look forward to !***

FUZZ - Stress testing your projects/API/libraries

- **Max Moroz**

- Generator for library / API testing

- Several Fuzzing tools and techniques presented (see slides)

- Continuous Fuzzing is encouraged especially after patches are applied.

- Fuzzing-as a Service available based on **ClusterFuzz** (Free of charge) - **OSS Fuzz has 6000** Cores available for Fuzzing.

- Recommended to increase software project security and reduce vulnerabilities, crashes and security breaches.

AES67 - Standard for Audio over IP interop

!

AES70 - Controlling audio Devices

- **Conrad Bebbington - Focusrite**
- **AES67**
  - Audio standards for Audio over IP interoperability between different technologies.
    - **mainly uses existing open networking Standard IT technology**
    - Audio Format linear PCM - with different qualities
    - Packetization over RTP, no CSRC
    - Syncchronisation : IEEE 1588-2008 PTP clock. Explained
- **Standardisation Improves interoperability !**
- **AES67 is supported in Upipe and Gstreamer except Connection management.**

See you at IBC’17 and FOSDEM’18…Of course !

- **Christophe Massiot** - Open Head End
- **Kieran Kunhya** - Open Broadcast systems
- **Adi Kouadio** - EBU
- **Frans De Jong** - EBU