

EBU

OPERATING EUROVISION AND EURORADIO

Next Generation Audio

Tuesday, October 8th – ASBU

EBU

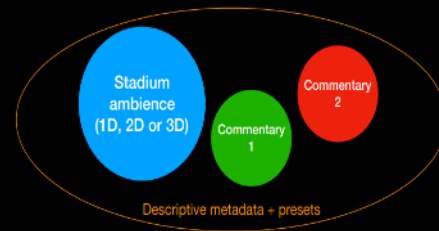
OPERATING EUROVISION AND EURORADIO



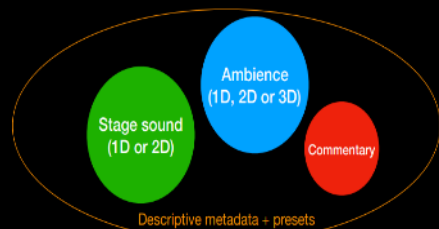
NGA FEATURES...

- › Different type of audio elements: channel-based, object based, scene-based audio
- › **Audio Objects**
 - › **Immersive** Audio with the addition of height elements
 - › **Flexibility**: one production “master” to serve a multitude of speaker layout configurations
 - › **Personalized** experience
- › More efficient audio codecs

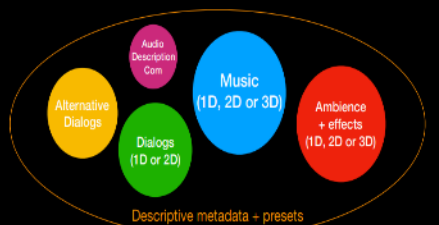
★ Sport contents



★ Shows, concerts, operas



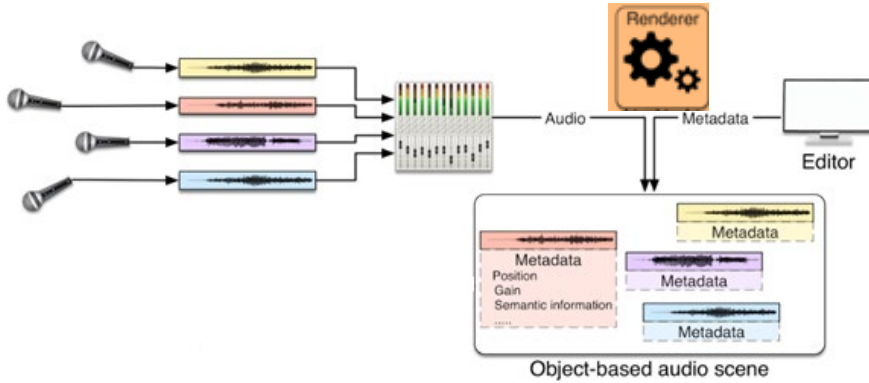
★ Feature films, dramas



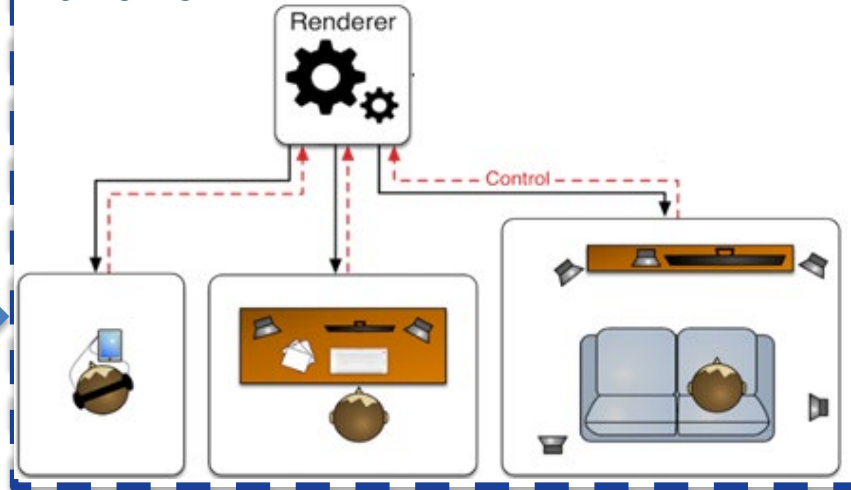
AN EXAMPLE



Production



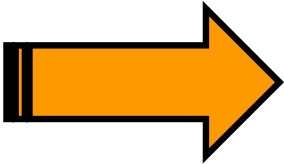
At home



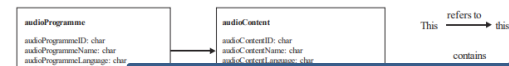
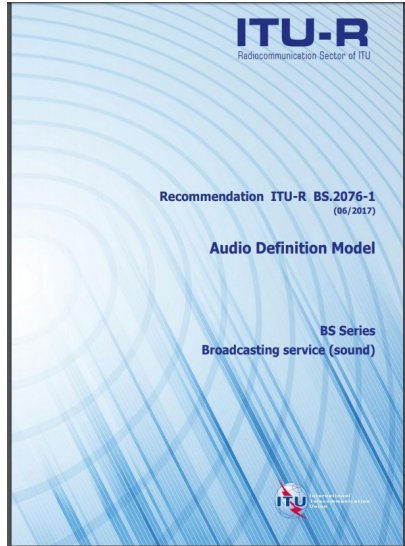
NGA TECHNOLOGY PROVIDERS



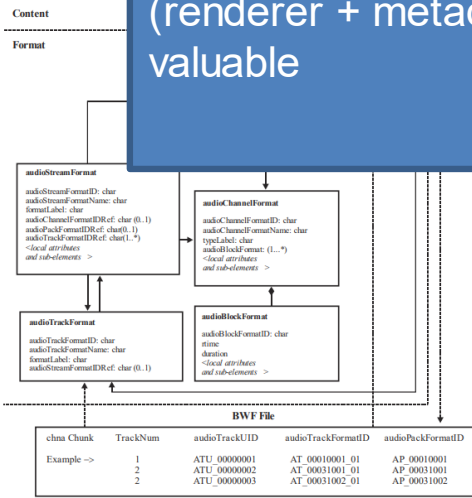
- › AC-4 (Dolby)
- › MPEG-H Audio (Fraunhofer IIS)
- › DTS-UHD (Xperi)



- ❑ Production tools/codecs available in the market
- ❑ Multiple standardised renderers & metadata



Common production format (renderer + metadata) is clearly valuable



PECIFICATION Version 1.0

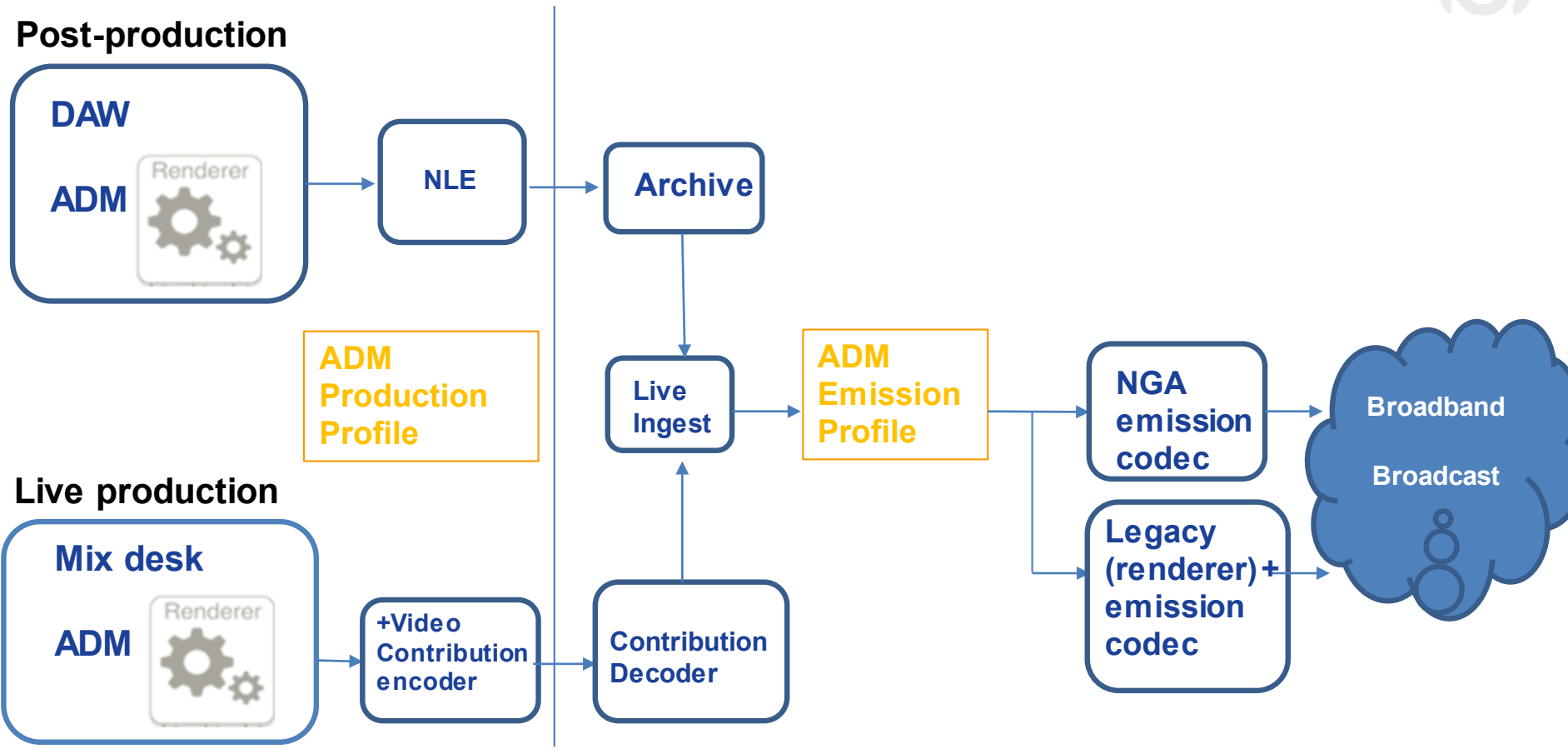
eneva
arch 2018

- Native interpretation of ADM
- Open source implementation

@ITU – ROADMAP TO THE ADM RENDERER



END-TO-END CHAIN: W.I.P.



@TEL AVIV



- › Parallel production of the event, mixing and transmitting it live with [Next Generation Audio](#) in the MPEG-H Audio format via the Eurovision FINE network.
- › Technology partners for the MPEG-H NGA demonstration at the Eurovision Song Contest 2019 are:
[ATEME](#), [Fraunhofer IIS](#), [Jünger Audio](#), [Sennheiser](#), [Solid State Logic](#) and [TELOS ALLIANCE](#).
- › Live reception:
 - › TV set + Soundbar
 - › Tablet

› Production

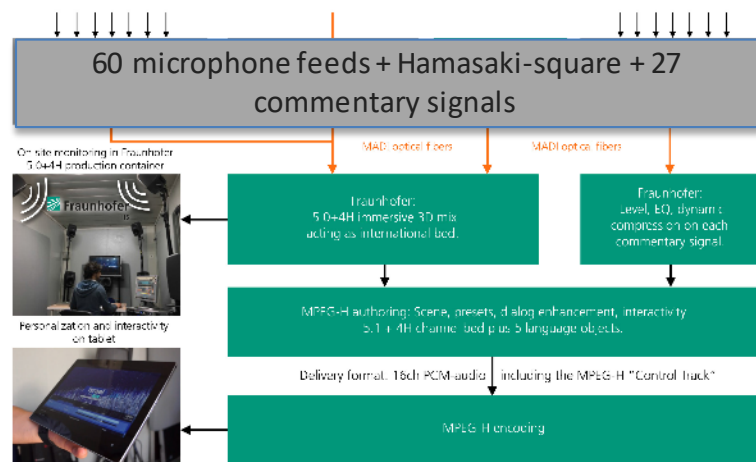
- › ~60 microphone feeds + 6 additional microphone feeds
- › ~27 commentators

› MPEG-H + 5.1 HE-AAC

- › 10ch (5.1+4H bed)
- › 1 Obj: Host
- › 4 Objects for 4 languages (English, French, Spanish, Italian)
- › The 5.1 HE-AAC generated from the first 5 channels of the 5.1+4H bed + English commentary mixed in the centre

› TS: constant bitrate at 12 Mbps

- › Video: 1080i50 (interlaced), HEVC ~10 Mbps
- › AAC 5.1 ~256 kbps
- › MPEG-H (5.1+4H + 1 Host + 4 languages) @480 kbps



TABLET: INTERACTIVE DEMO





- › Eurovision Song Contest

- › Euro2020 – Radio NGA Trial
 - › to select different languages (e.g. English, French, German, Italian, Spanish) for the live commentary
 - › to fade between 2 selected reporters through a fader function (e.g. the languages of the two teams)
 - › to balance between speech and ambience
 - › to choose between different positions of soundscapes from the stadium (e.g. fan sections)
 - › to select additional special audio description for disabled football supporters

Tech documents

- **Next generation audio** @EBU: tech.ebu.ch/nga + tech.ebu.ch/as
- What we (EBU/EBU Members) would like to achieve in terms of an **open codec-independent workflow for NGA production deployment**: page 11, <https://tech.ebu.ch/docs/techreports/tr045.pdf>
- **ADM** (Audio Definition Model) metadata: ITU-R BS.2076-1 (06/2017) https://www.itu.int/dms_pubrec/itu-r/rec/bs/R-REC-BS.2076-1-201706-1!!PDF-E.pdf
- **Long-form file format** for the international exchange of audio programme materials with metadata: ITU-R BS.2088-0 (10/2015) https://www.itu.int/dms_pubrec/itu-r/rec/bs/R-REC-BS.2088-0-201510-1!!PDF-E.pdf
- **Serial ADM**: ITU-R BS.2125 https://www.itu.int/dms_pubrec/itu-r/rec/bs/R-REC-BS.2125-0-201901-1!!PDF-E.pdf
- **ADM renderer** for advanced sound systems: ITU-R BS.2127-0 (06/2019) https://www.itu.int/dms_pubrec/itu-r/rec/bs/R-REC-BS.2127-0-201906-1!!PDF-E.pdf
- **Serial ADM over AES3** – SMPTE ST 2116 (Status: Draft Publication): <https://kws.smpte.org/higherlogic/ws/public/projects/503/details>

Software/Guidelines

- **ADM guidelines**: a set of guidelines to help professional users understand the ADM, including examples <https://adm.ebu.io/>
- **ADM import/export**: <https://github.com/IRT-Open-Source/libadm>
- A **C++ library** to render ADM content according to **Recommendation ITU-R BS.2127**: <https://github.com/ebu/libear>
- **EAR Production Suite**: <https://lab.irt.de/combining-our-nga-efforts-in-an-open-source-adm-production-tool/>
 - If you are interested in getting an “**early access**” to the EAR Production plugins, please send an email to Benjamin Weiss/IRT (benjamin.weiss@irt.de)



Thank you!