

# Next Generation Audio best practices

IBC EBU Booth – Amsterdam - 2019



**EBU**

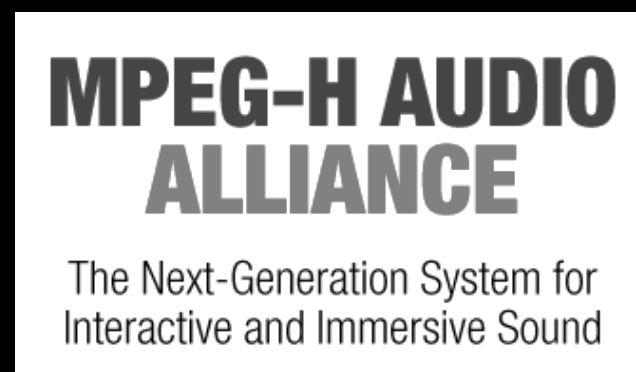
**PRODUCTION  
Strategic Programme**

# Why producing objects?

# Immersion & Interactivity



# Immersive audio is everywhere



# (machine) Interactivity

Speakers or headphones?

How many speakers?

Where are speakers?

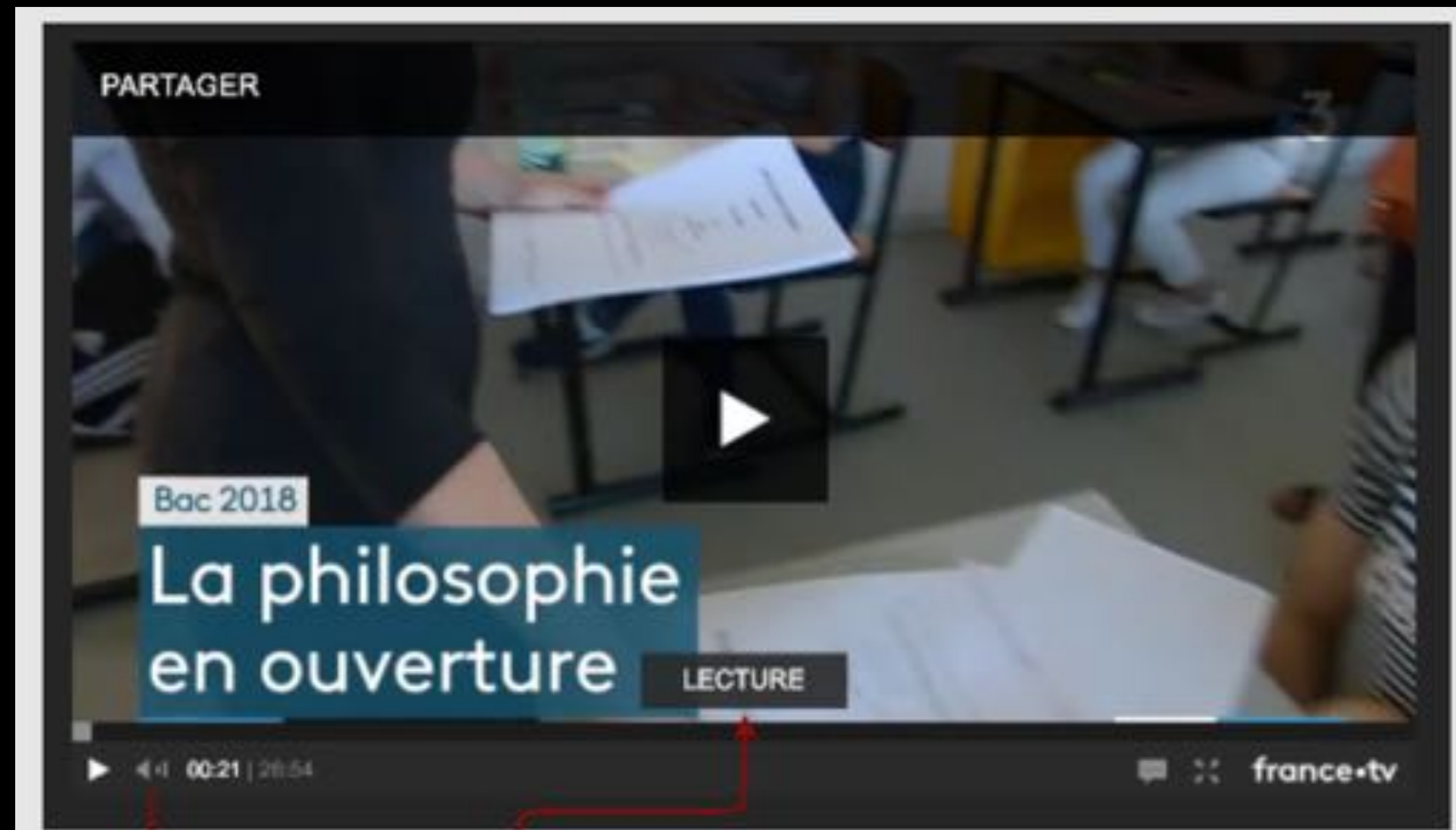
How sounds the room?

# (end-user) Interactivity

The image shows a video player interface for a video titled "La philosophie en ouverture" (Bac 2018) from france.tv. The video is paused at 00:21 of a 26:54 duration. The interface includes a play button, a progress bar, and a volume control icon. Below the video player, there are four vertical sliders and a language selection menu. The sliders are labeled "SOUND LEVEL", "DIALOG LEVEL", "AUDIODESCRIPTION LEVEL", and "RENDERING TYPE". The language selection menu shows the French flag and the UK flag. Annotations with red arrows point to various parts of the interface, explaining their functionality:

- "PARTAGER" (Share) button in the top left corner.
- "Bac 2018" label above the video title.
- "La philosophie en ouverture" video title.
- "LECTURE" (Reading) label below the video title.
- Progress bar showing "00:21 | 26:54".
- "france.tv" logo in the bottom right corner.
- Helping text: "Helping text is displayed when adjusting a parameter and/or when mouse flies over" (pointing to the sliders).
- Annotation: "simple clic on the audio icon displays the audio bar" (pointing to the volume icon).
- Annotation: "Clic on icon = activation/de-activation + displays slider if activated" (pointing to the sliders).
- Annotation: "Clic on icon = displays menu" (pointing to the language selection menu).
- Labels below the sliders: "SOUND LEVEL", "DIALOG LEVEL", "AUDIODESCRIPTION LEVEL", and "RENDERING TYPE".
- Label below the language selection menu: "LANGUAGE SELECTION".

# (end-user) Interactivity



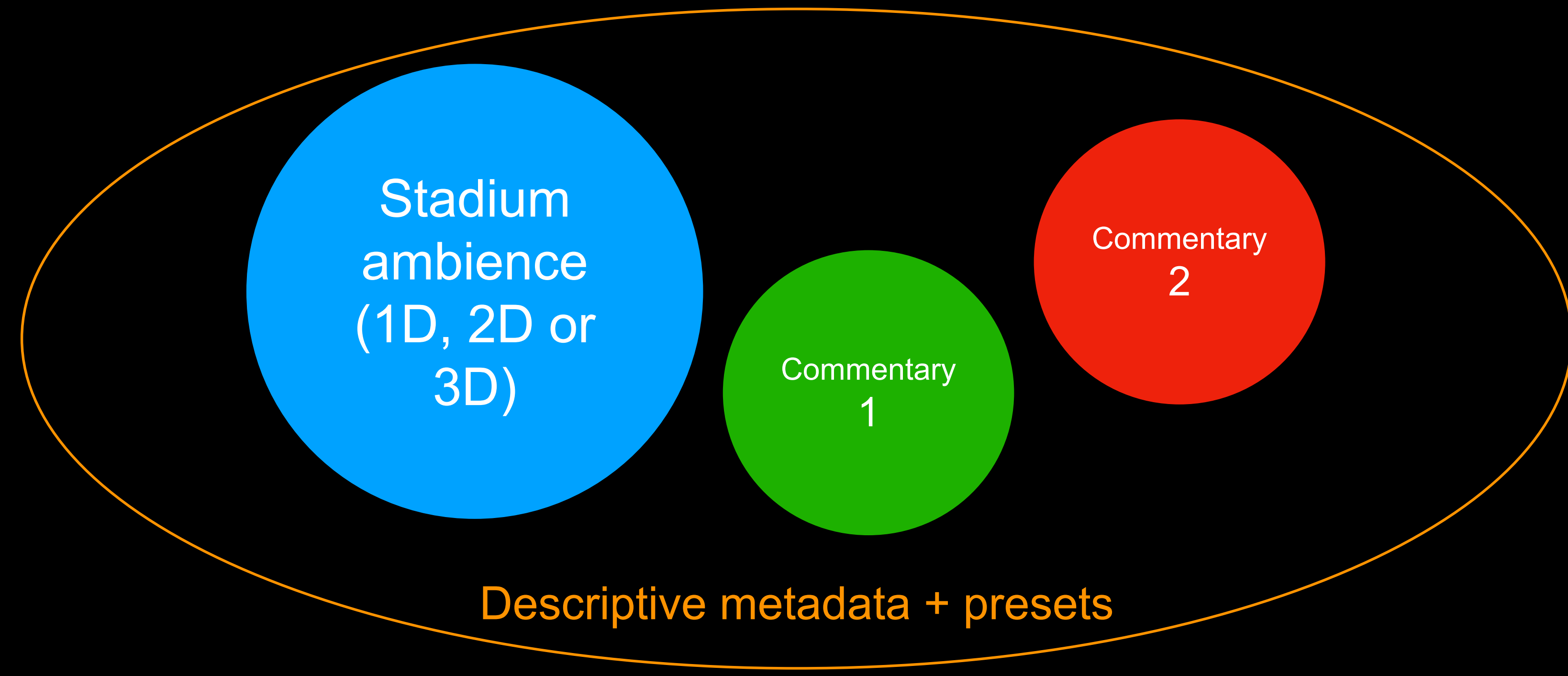
OK Google, switch in English and raise the dialog!



# How producing objects?

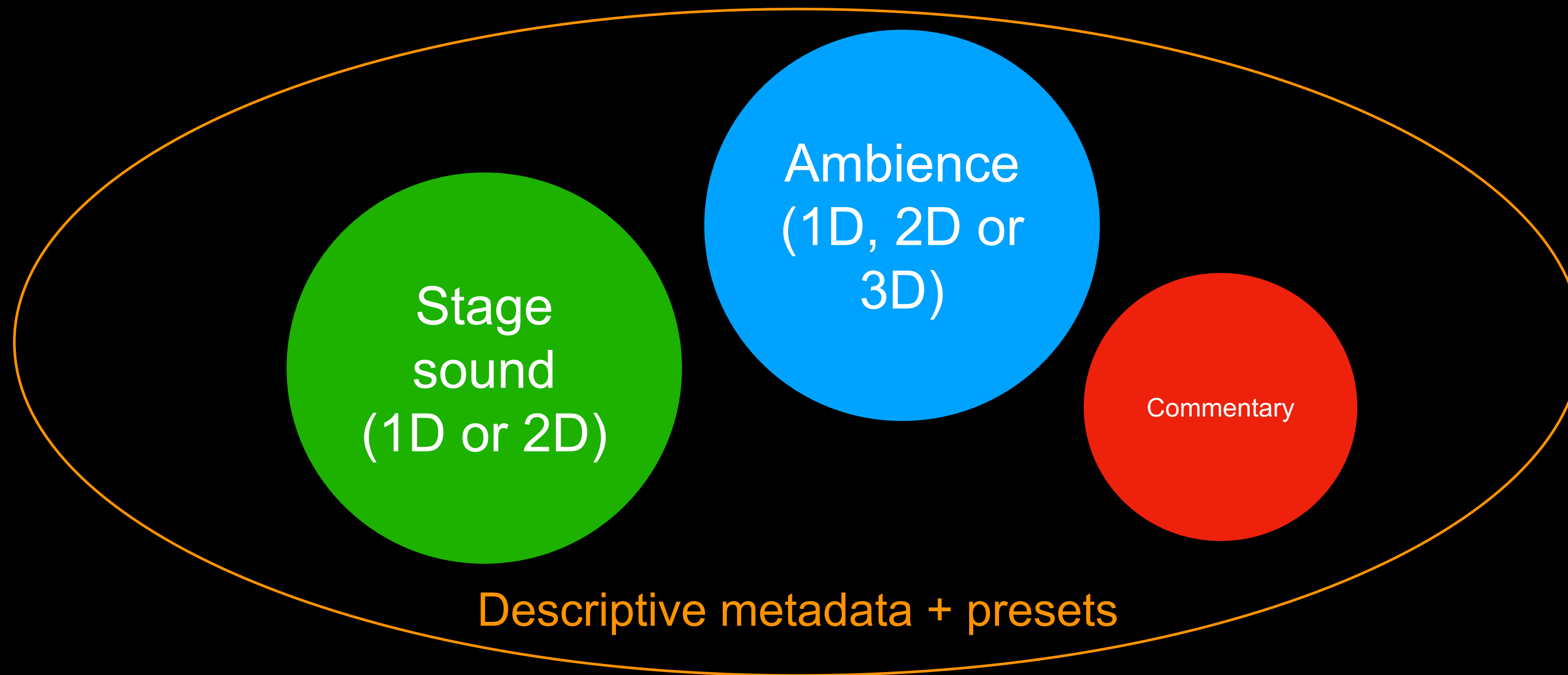
# Producing objets

## ★ Sport contents



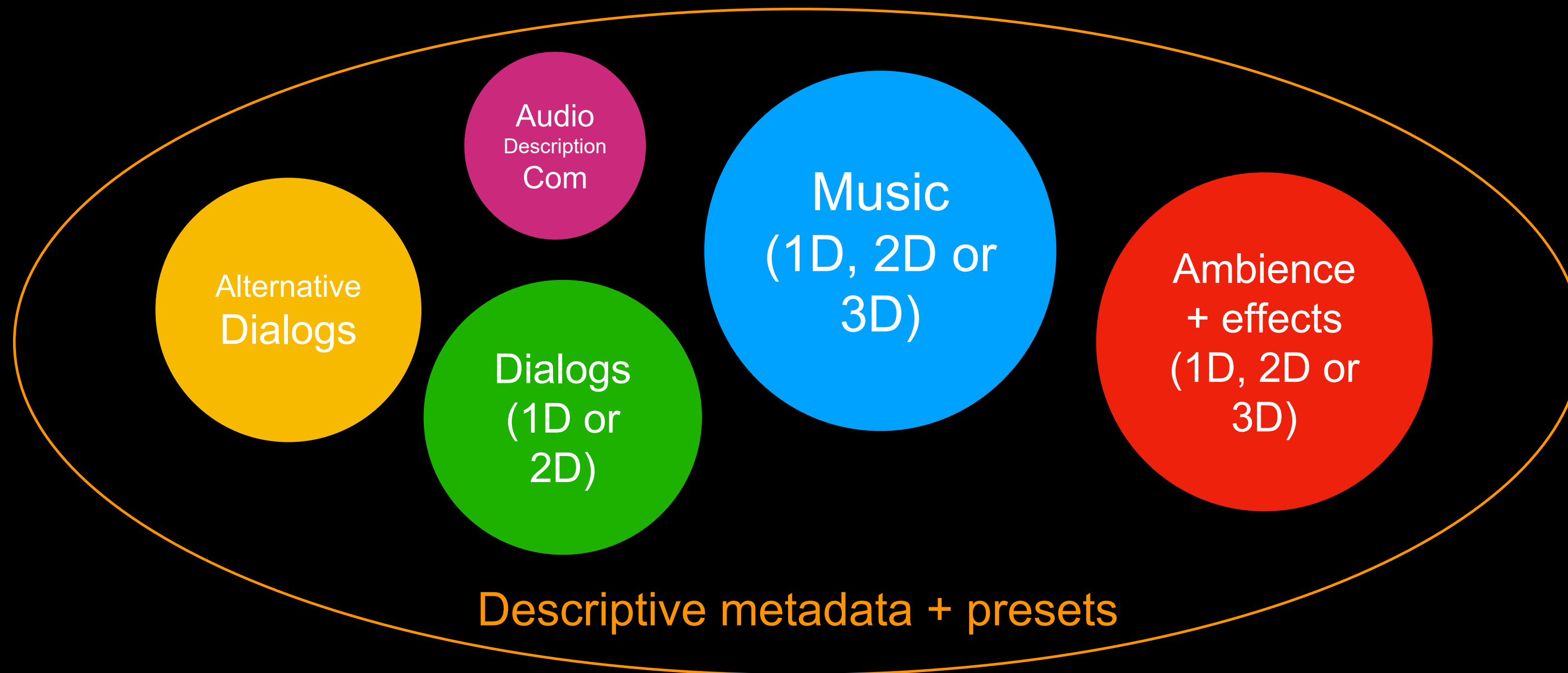
# Producing objets

- ★ Shows, concerts, operas

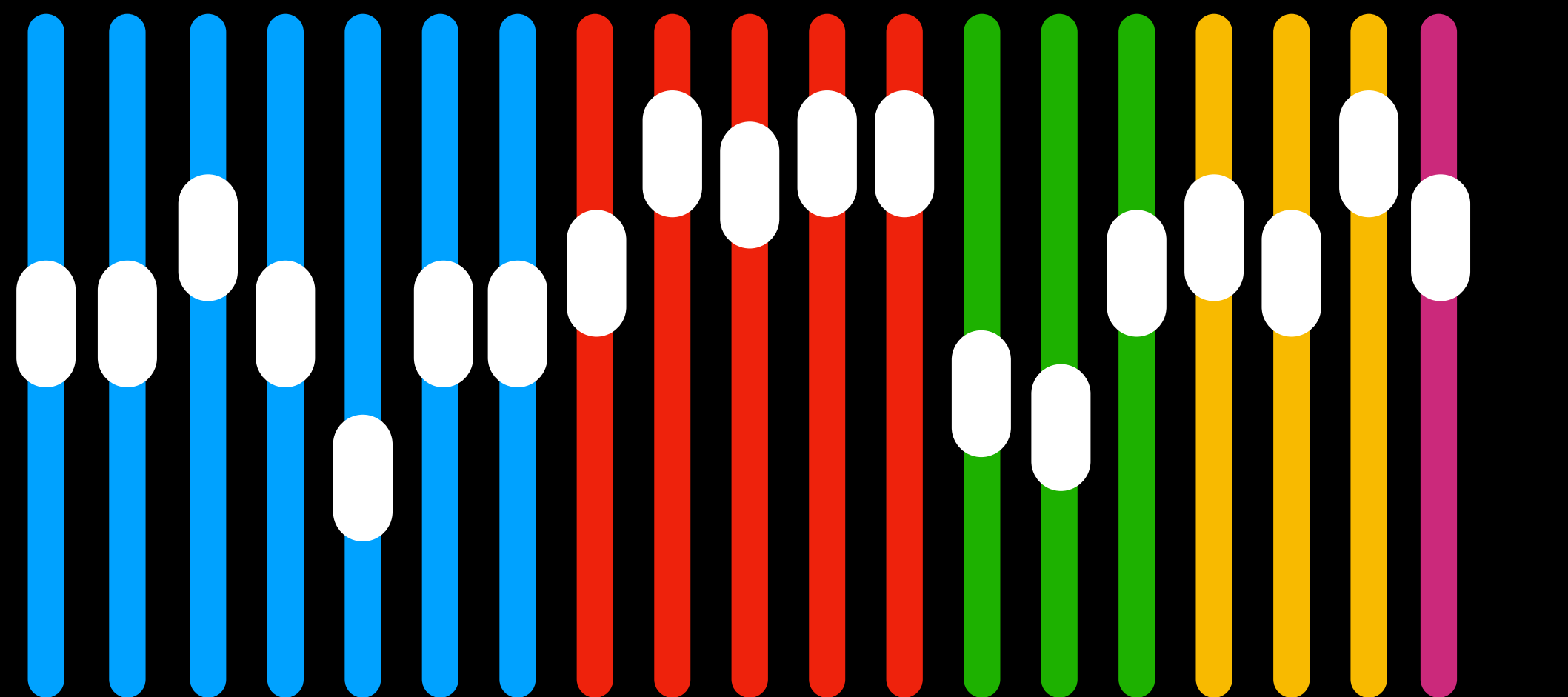


# Producing objets

## ★ Feature films, dramas



# Object Based Audio production



Music

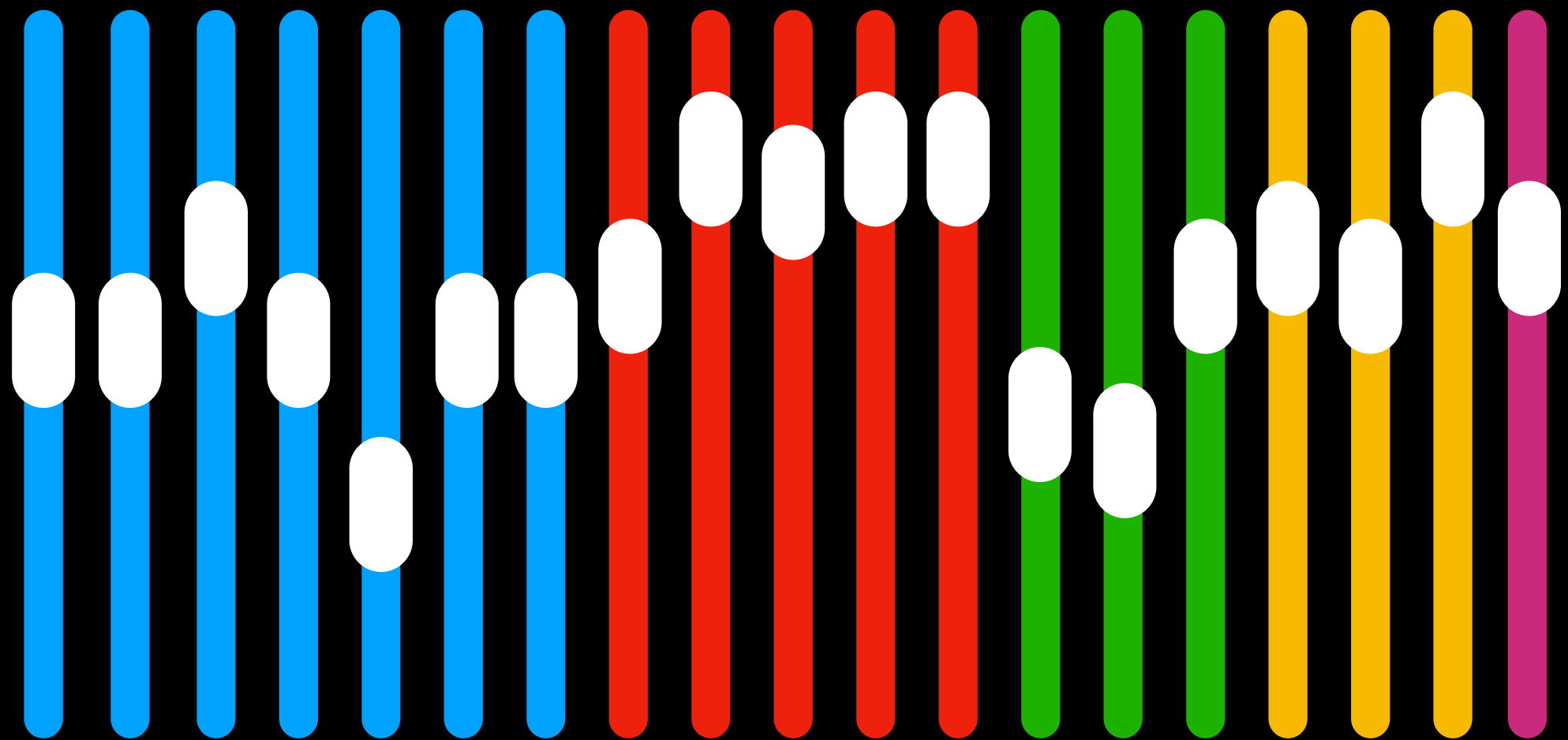
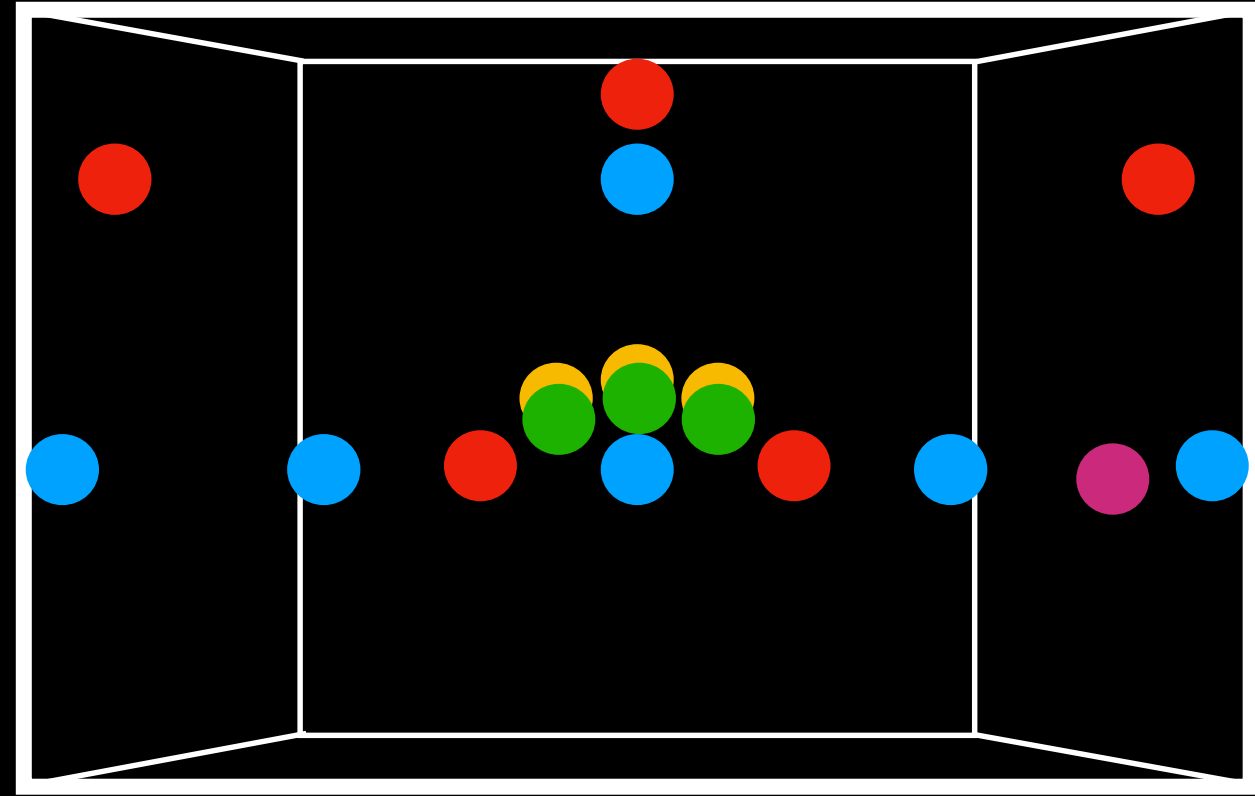
Ambience  
& effects

Dialogs  
Language #1

Dialogs  
Language #2

Audio  
Description

# Object Based Audio production



Music

Ambience  
& effects

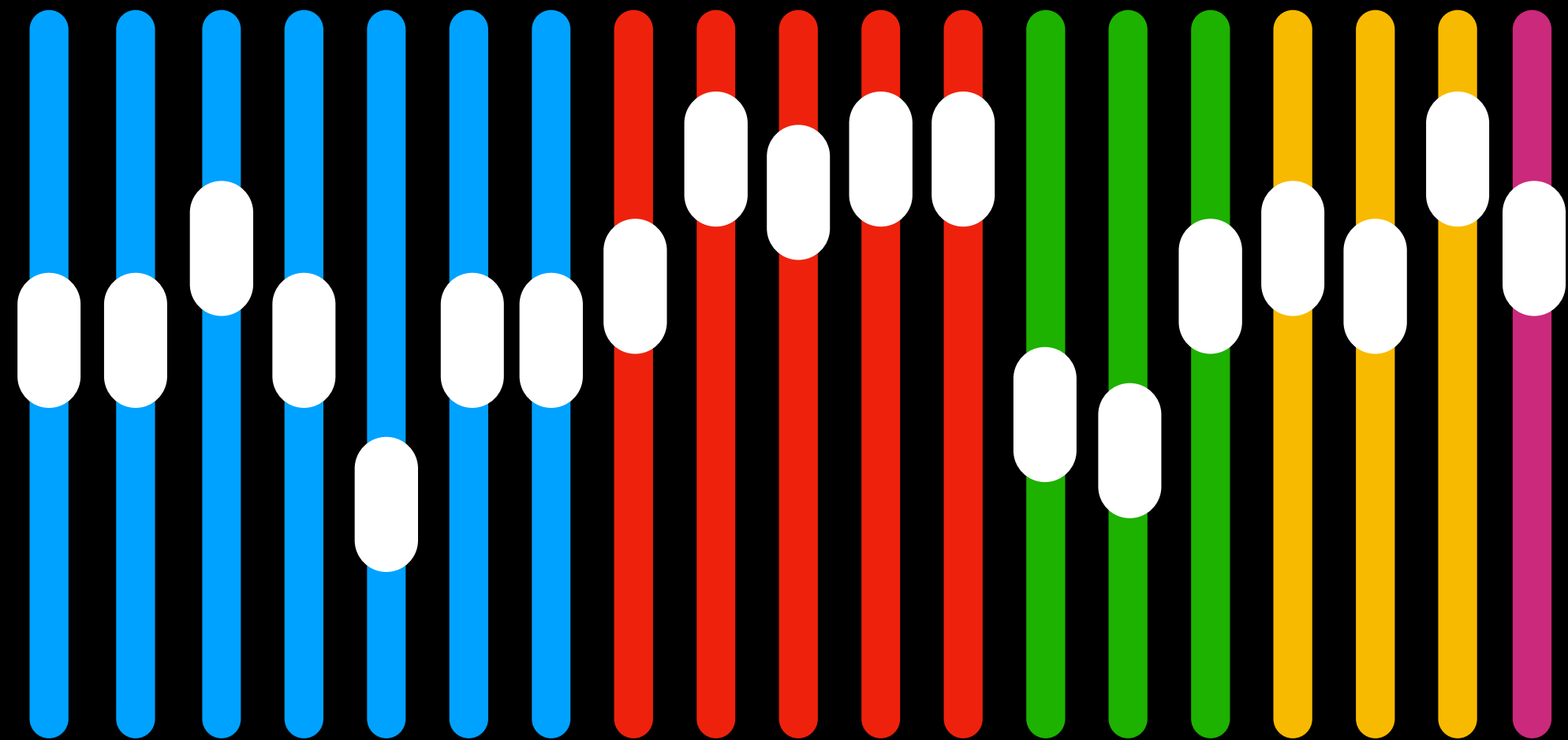
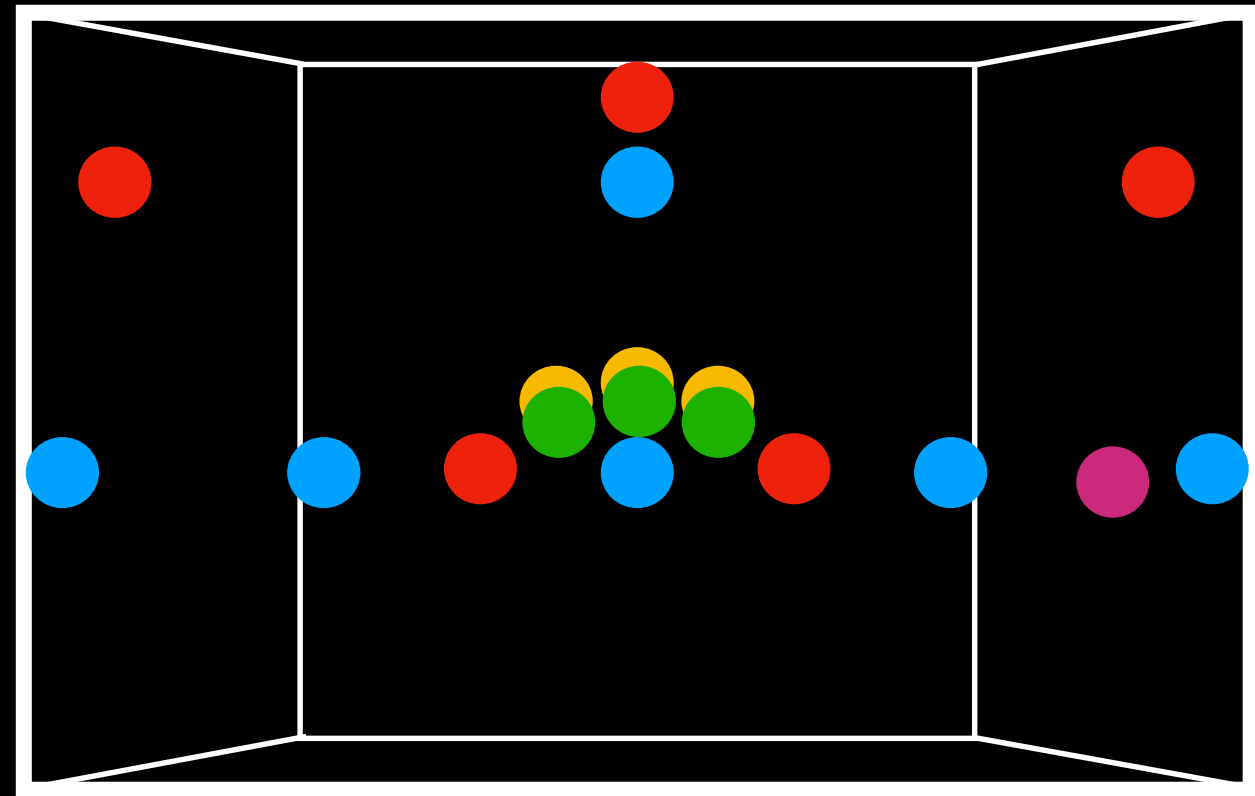
Dialogs  
Language #1

Dialogs  
Language #2

Audio  
Description

# Object Based Audio production

10:00:04:56



Music

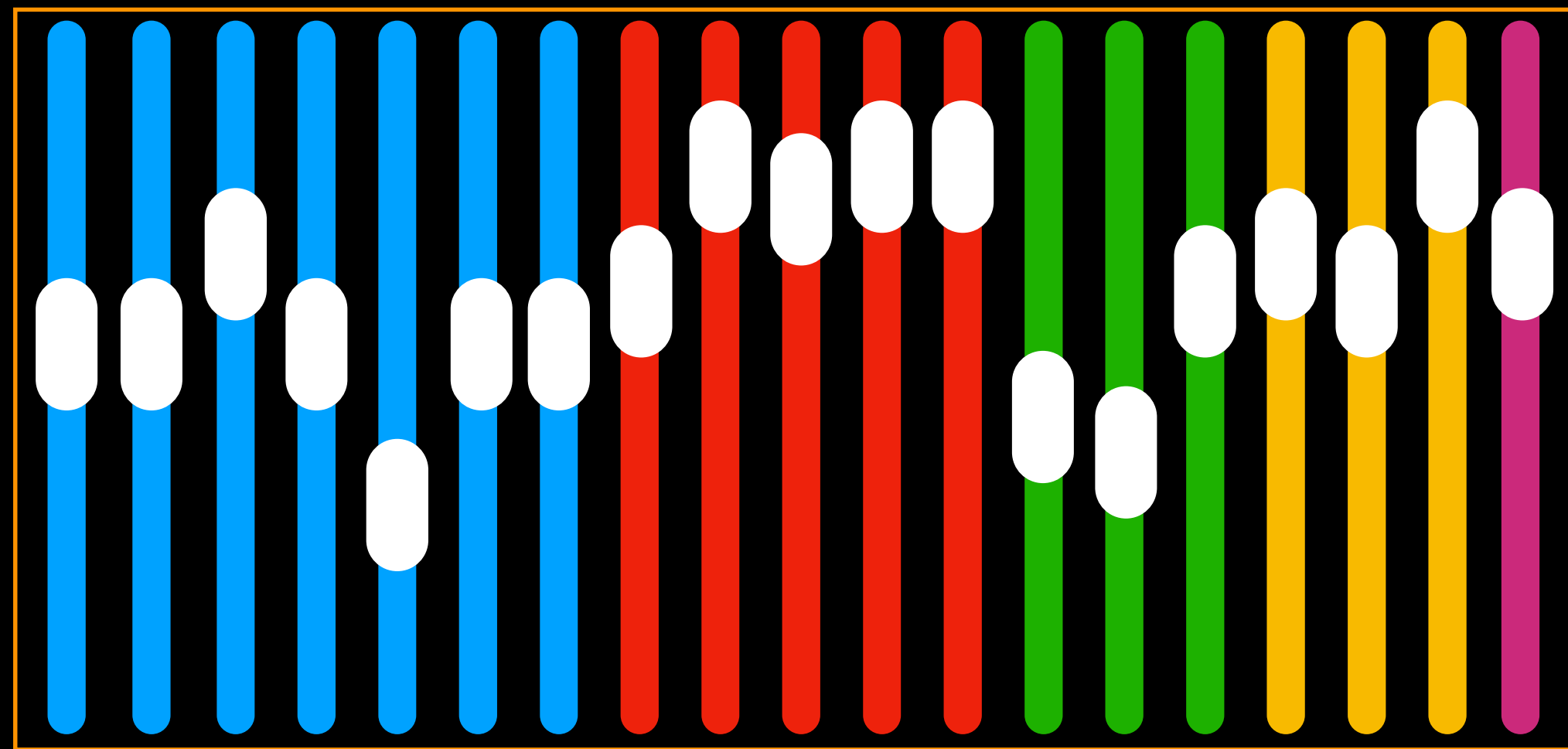
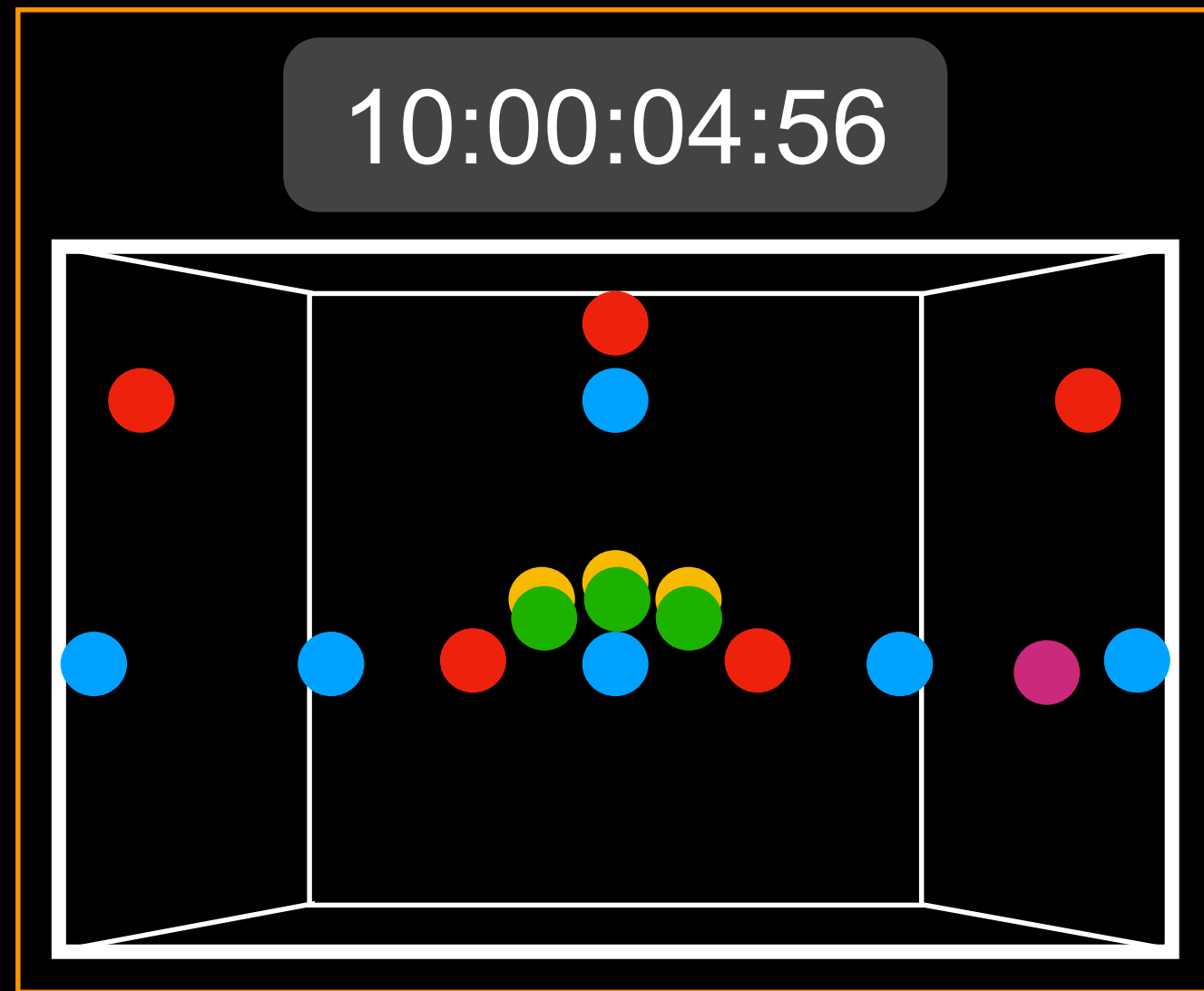
Ambience  
& effects

Dialogs  
Language #1

Dialogs  
Language #2

Audio  
Description

# Object Based Audio production



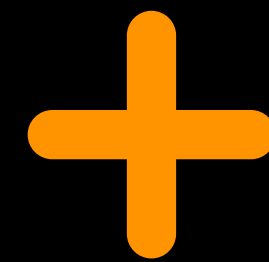
Music

Ambience  
& effects

Dialogs  
Language #1

Dialogs  
Language #2

Audio  
Description



Authoring Metadata

PGM#1 = M + A&E + D

PGM#2 = M + A&E + D

PGM#3 = M + A&E + D + AD

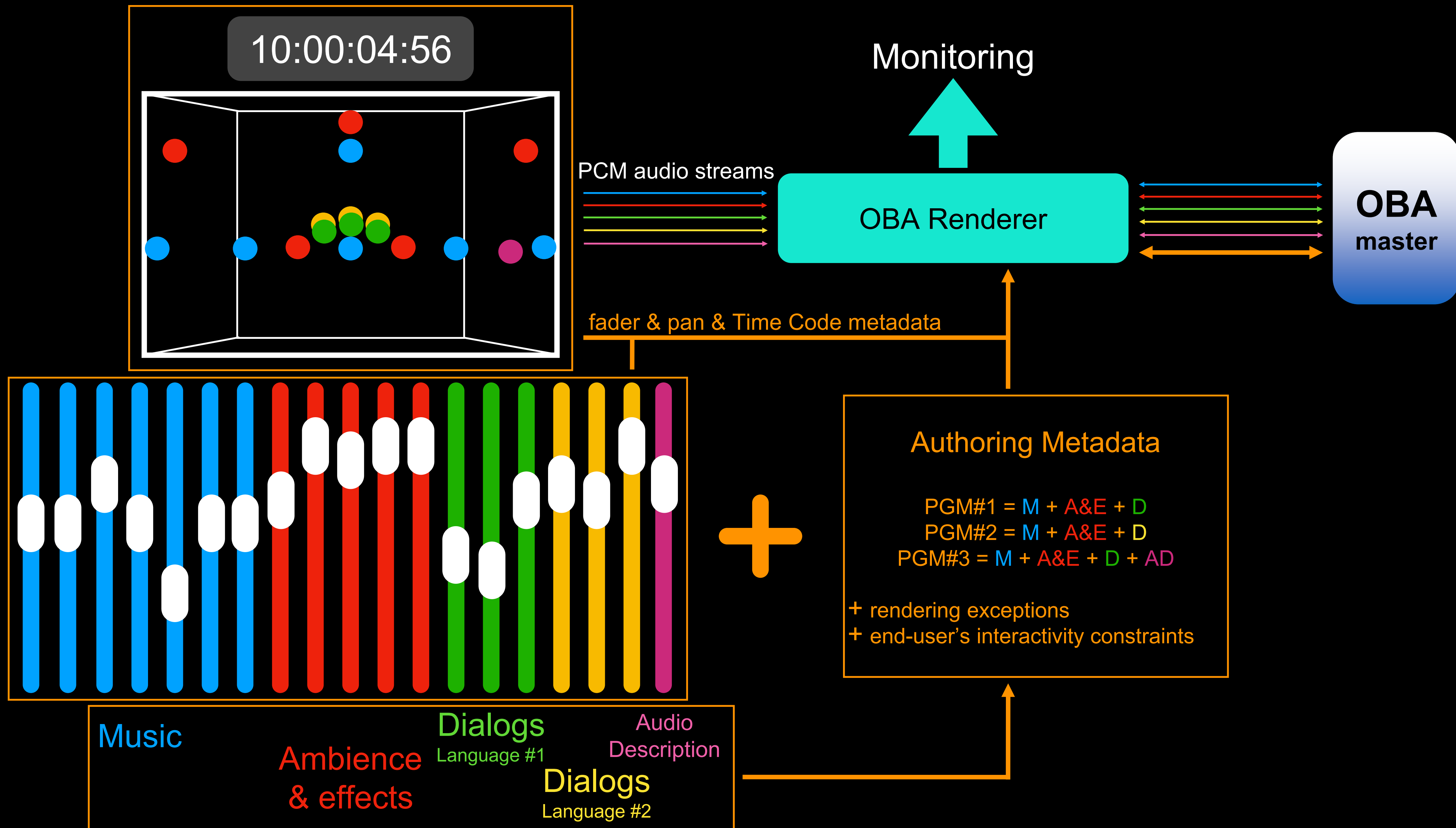
+ rendering exceptions

+ end-user's interactivity constraints

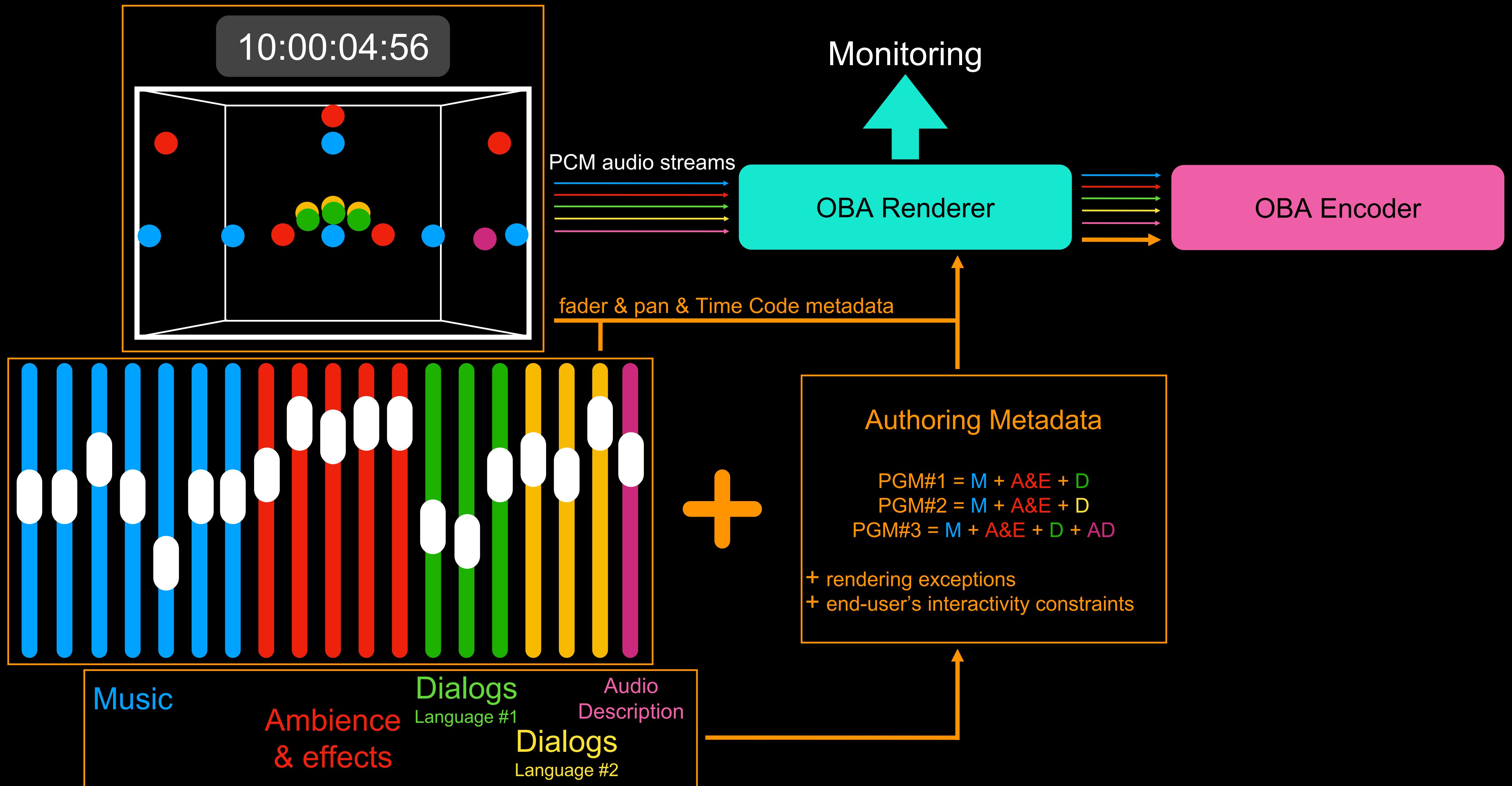




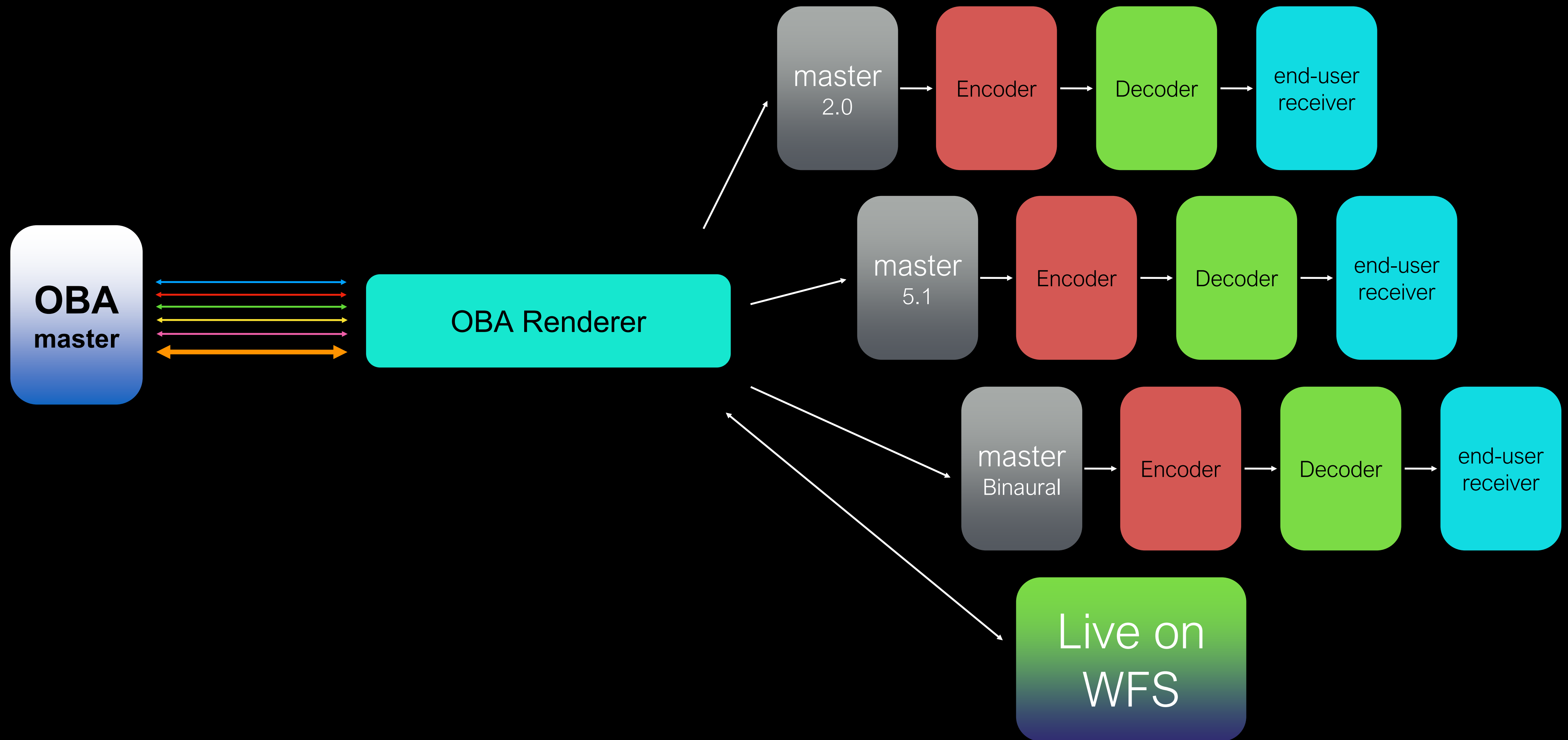
# Object Based Audio production



# Object Based Audio production



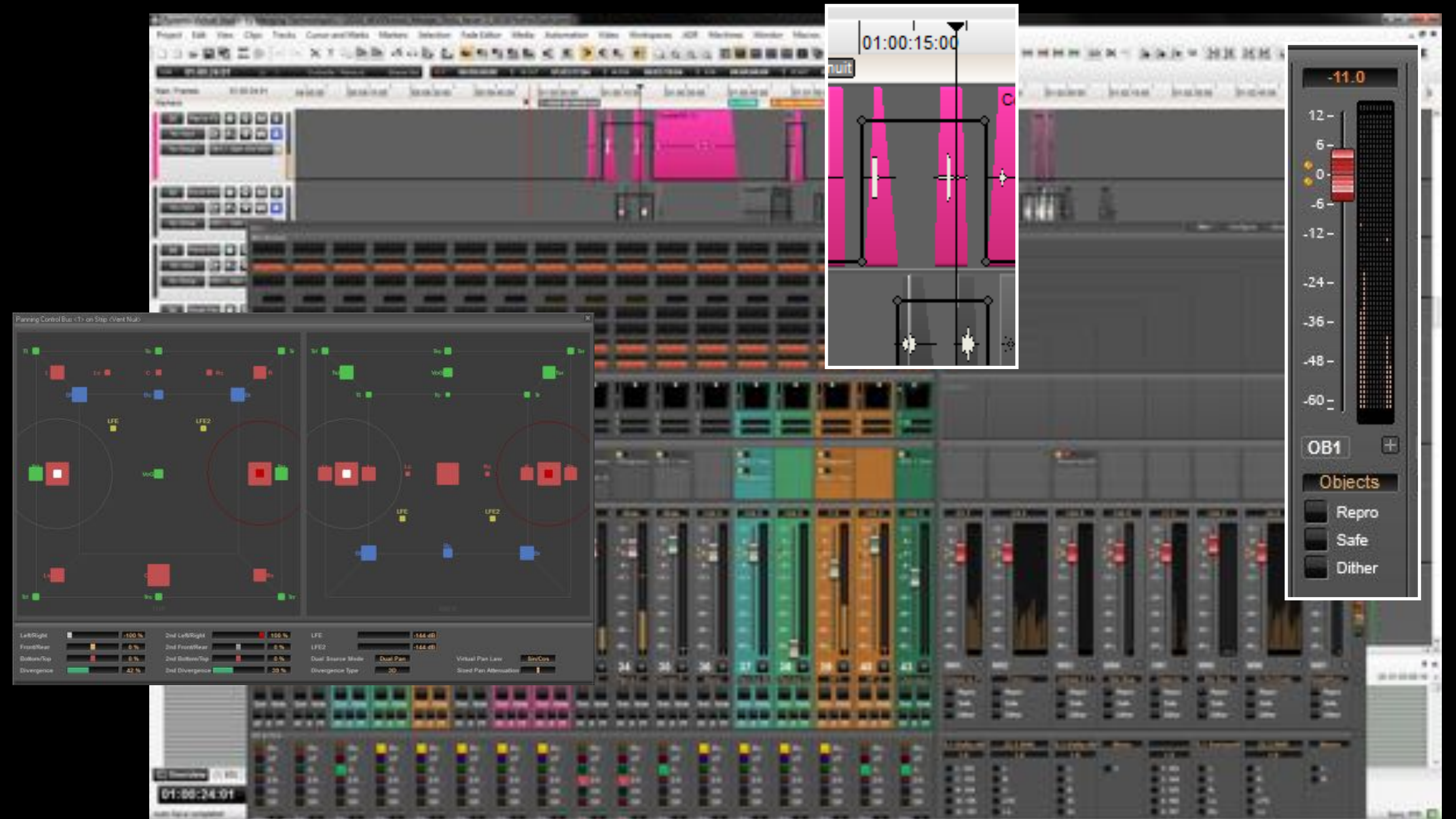
# 1st step: multiple formats generation



# Object-Based Audio broadcast workflow

Immersion  
+ metadata (native, *osc*)  
=  
Object-Based Audio  
Master (*ADM*)

Merging Pyramix 11:  
ADM export



# Object-Based Audio broadcast workflow

AVID + Dolby Atmos Production Suite

Immersion  
+ metadata (**atmos**)  
=  
Object-Based Audio  
Mastering



AVID Pro Tools 12.4:  
Atmos to ADM converter  
ADM import

# Trial & lessons learnt

# French Tennis Open 2018 - 2019



# French Tennis Open 2018



Schoeps ORTF-3D



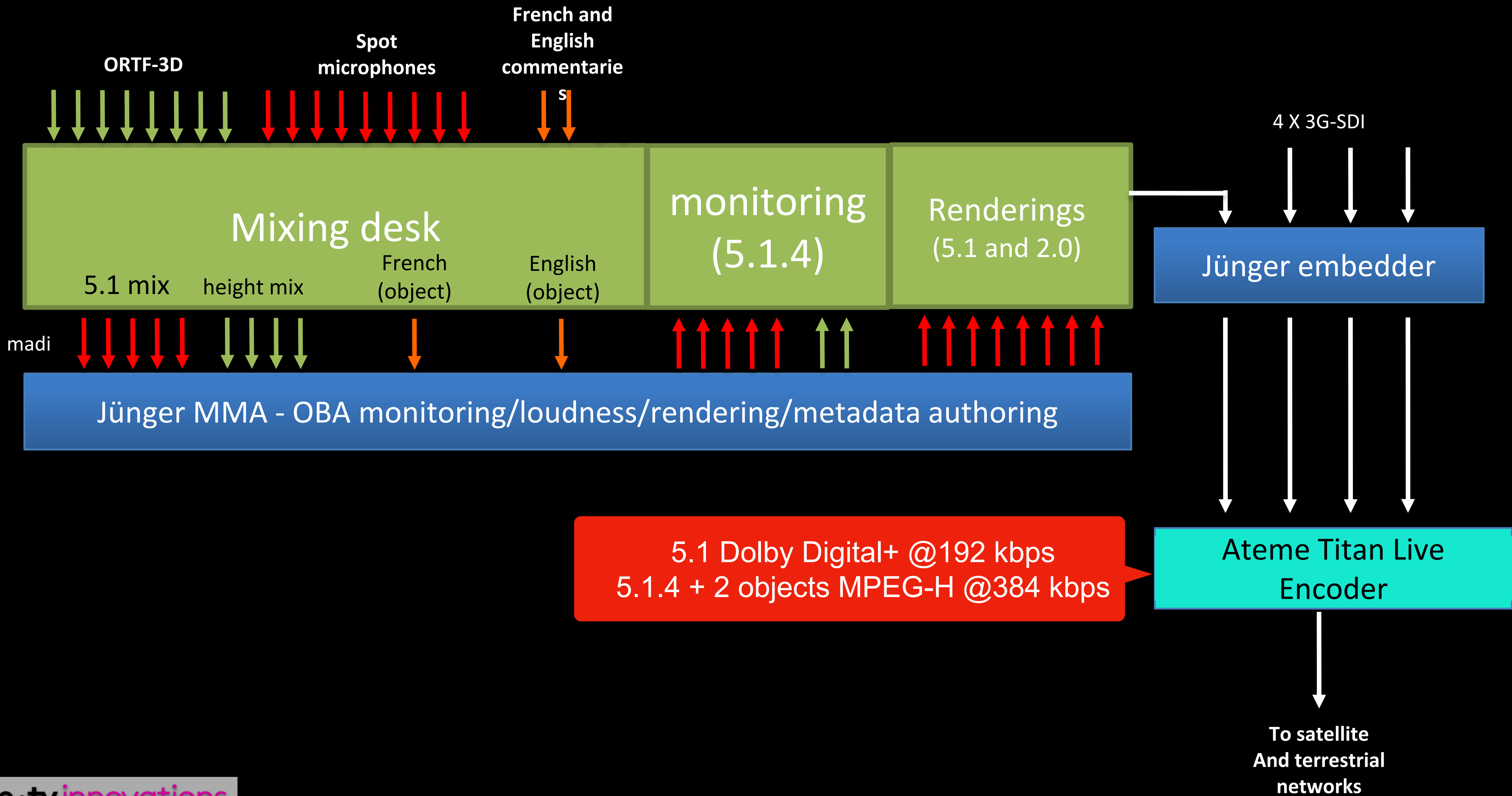
2 x Neumann KMR-81



4 x Schoeps Super-CMIT



# French Tennis Open 2018



5.1 Dolby Digital+ @192 kbps  
5.1.4 + 2 objects MPEG-H @384 kbps

# French Tennis Open 2018 - 2019



MPEG-H binaural rendering

MPEG-H 3D audio rendering over sound bar



# European Athletics Championship 2018



August 7th - 9th in Berlin

france•tv innovations  
& développements

tpc

BBC

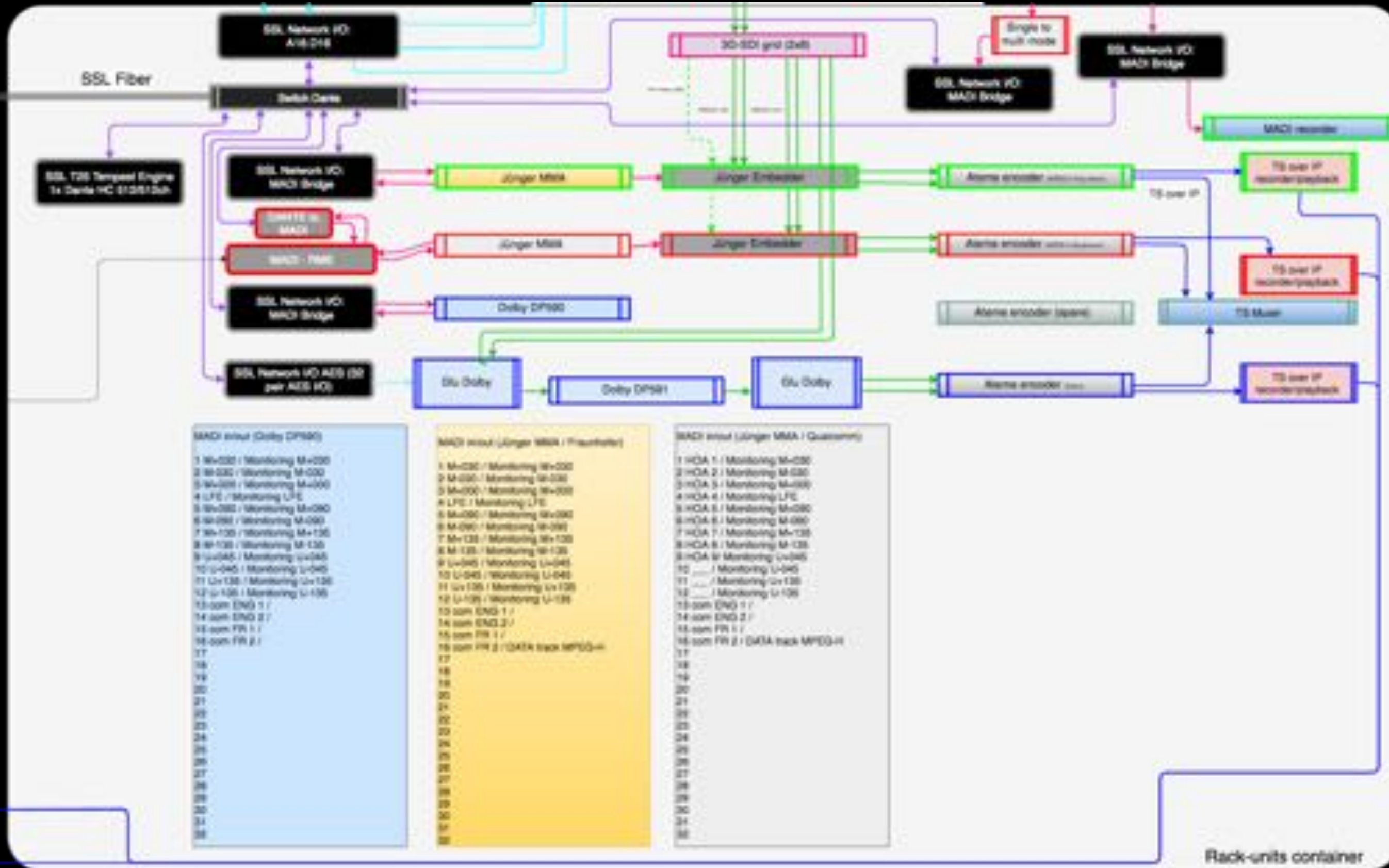
EBU  
OPERATING EUROVISION

IRT

Rai

b com

# European Athletics Championship 2018



- 3 parallel Object-Based audio encodings :
- AC4 Atmos: 4+7+0 & 4 objects (Dolby)
  - MPEG-H: 4+7+0 & 4 objects (Fraunhofer IIS)
  - MPEG-H: HOA 2th order & 4 objects (Qualcomm)

## Special thanks to our audio partners:

- **Ateme** - video encoder + MPEG-H coder + AC4 Atmos pass-through
- **b<>com** - HOA capturing tools and plugins
- **Dolby Laboratories** - AC4 Atmos chain
- **Fraunhofer IIS** - MPEG-H chain based on multichannel + objects
- **Jünger** - OBA monitoring tools
- **Klang:** - 3D audio monitoring over binaural (thanks to Areitec - official reseller)
- **Qualcomm** - MPEG-H chain based on HOA + objects
- **Schoeps** - main ambience microphone (thanks to Areitec - official reseller)
- **Solid State Logic** - main mixing desk + DANTE network



**EBU**

OPERATING EUROVISION AND EURORADIO

**TR 045**

**WHY BROADCASTERS NEED AN OPEN,  
CODEC-INDEPENDENT WORKFLOW FOR  
NGA PRODUCTION DEPLOYMENT**

SOURCE: AS

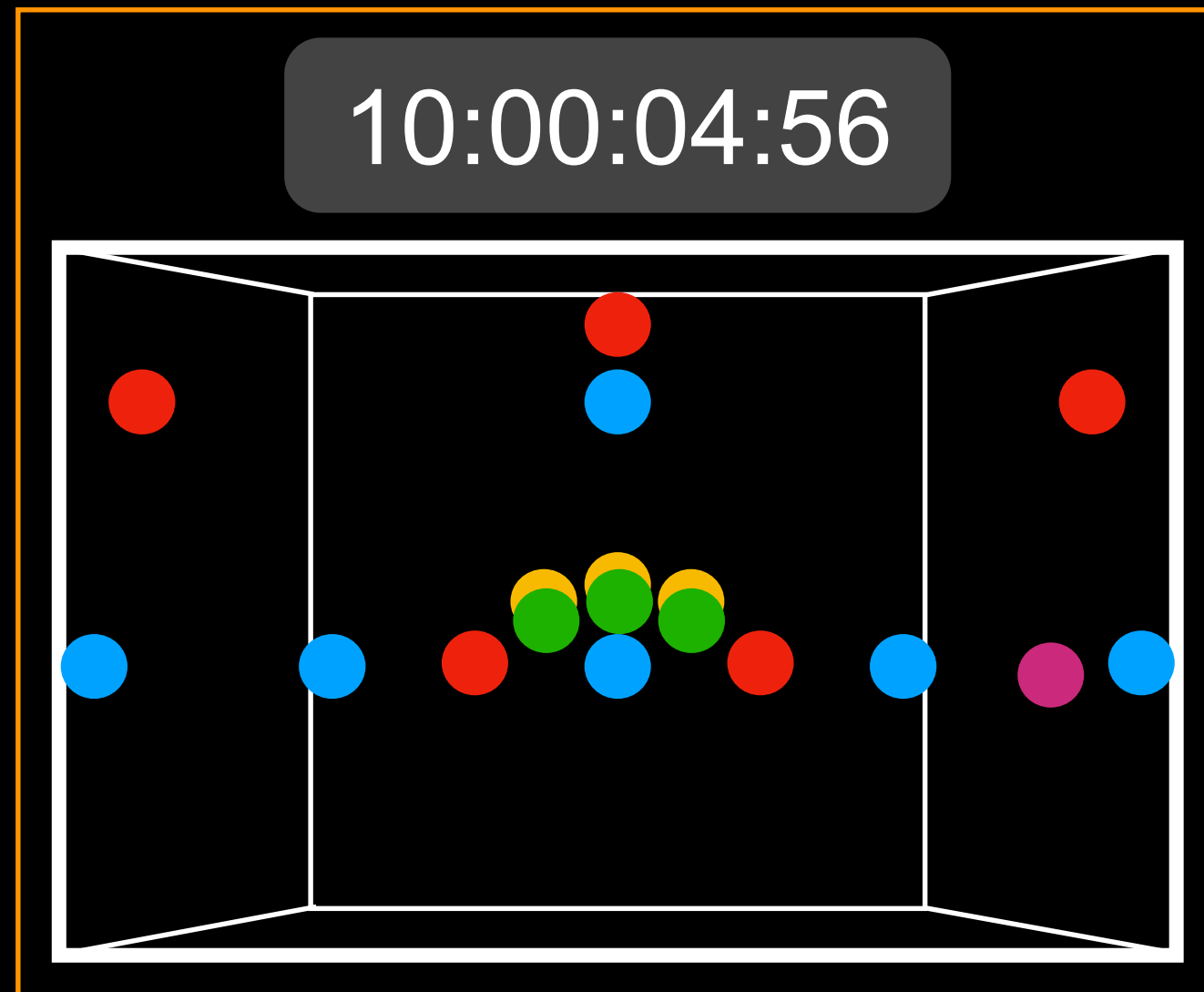
Geneva  
January 2019

ژانویه ۲۰۱۹  
ژنِیوا

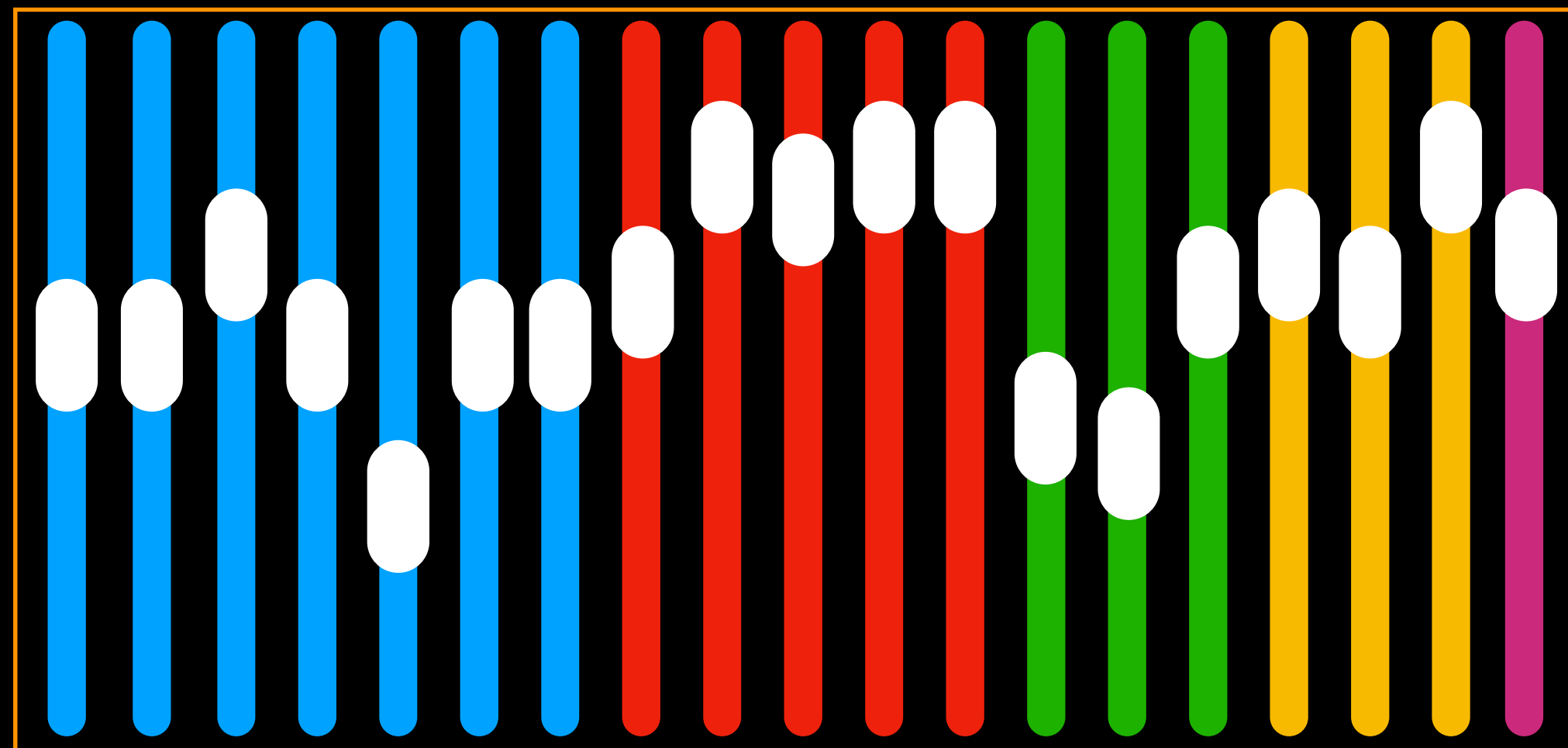
# EBU TR 045

Why broadcasters need an open,  
codec-independent workflow  
for NGA production deployment

# Object Based Audio production



Audio Definition Model  
an open-source metadata  
format for OBA



Music

Ambience  
& effects

Dialogs  
Language #1

Dialogs  
Language #2

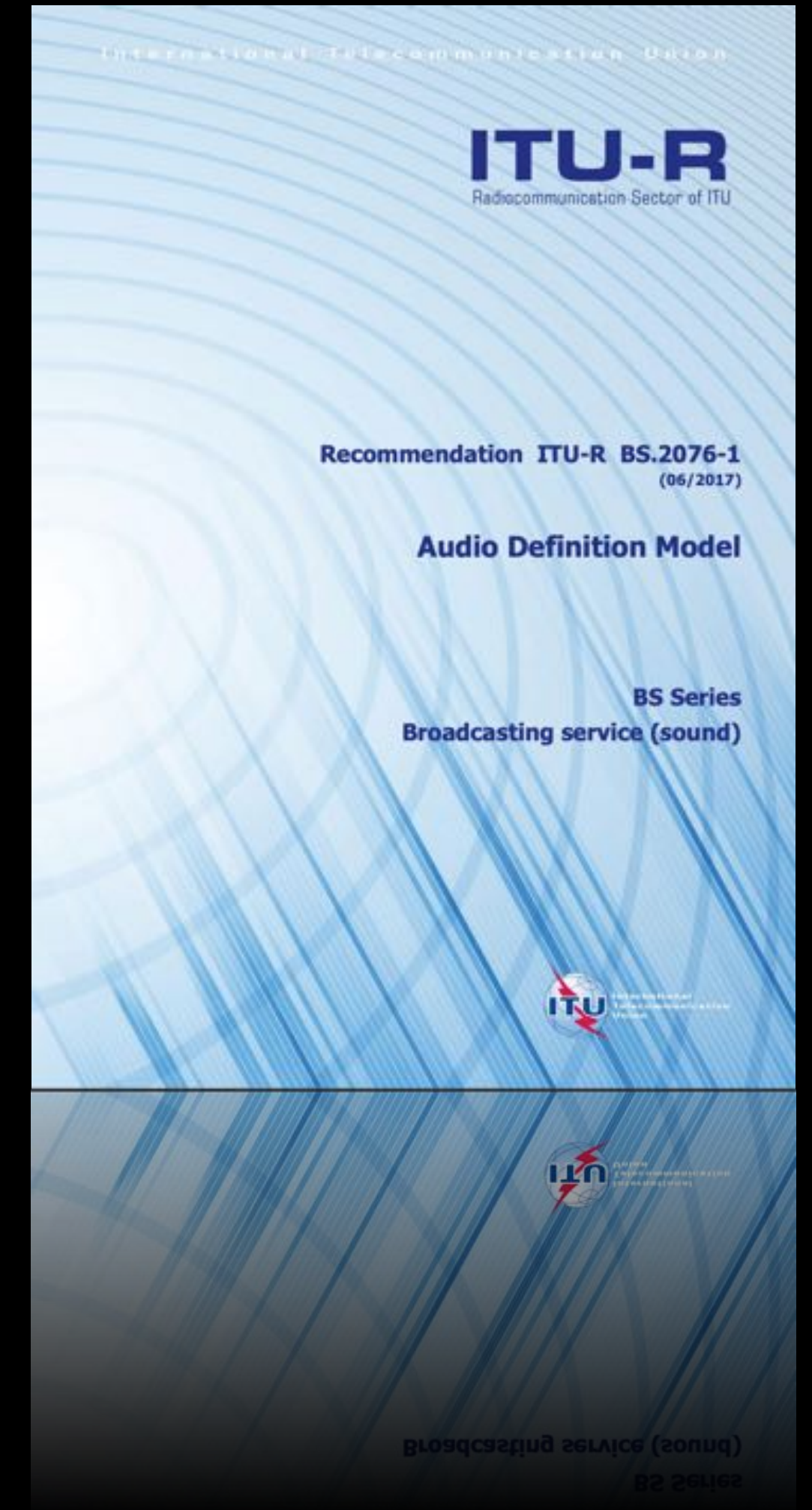
Audio  
Description



Authoring Metadata

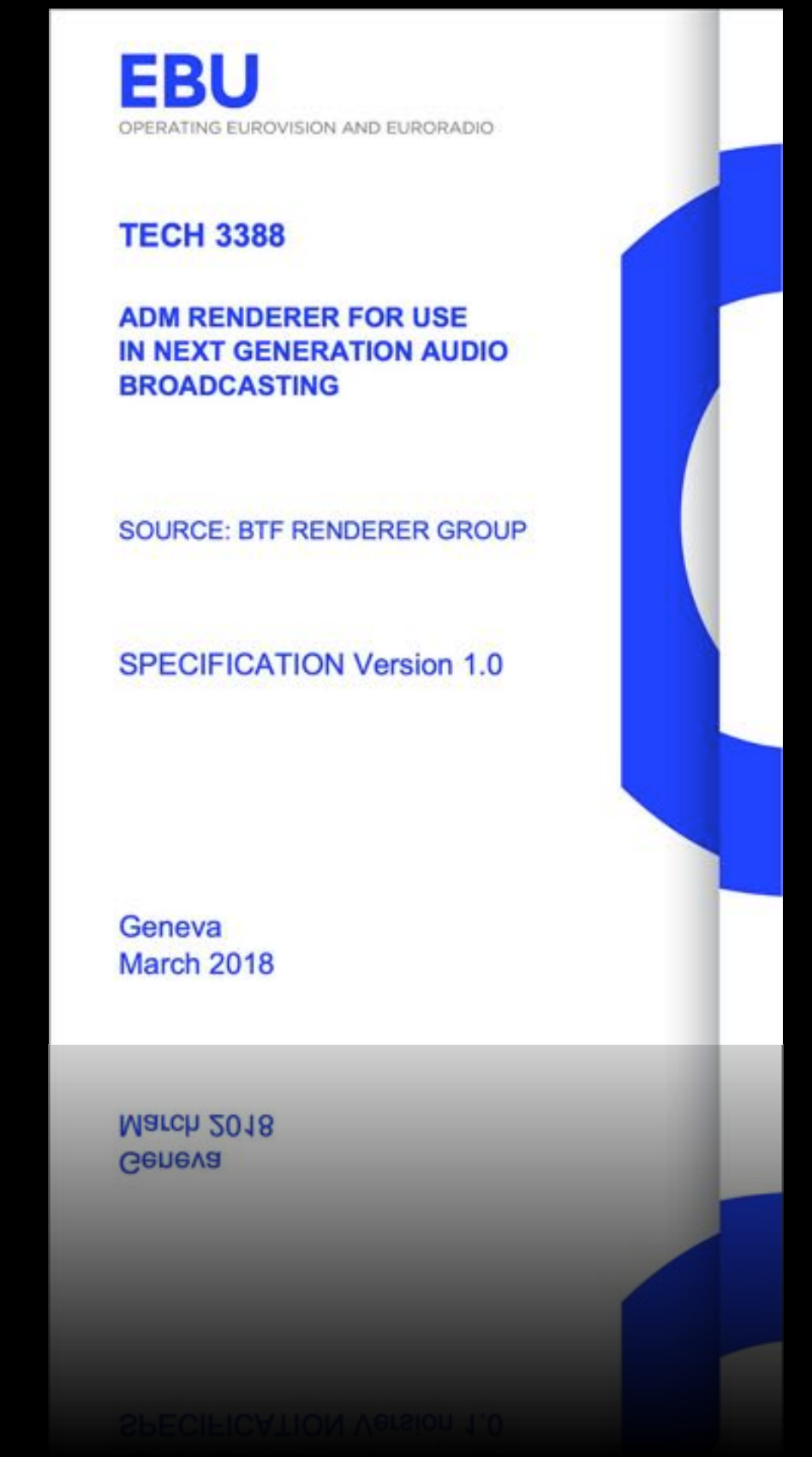
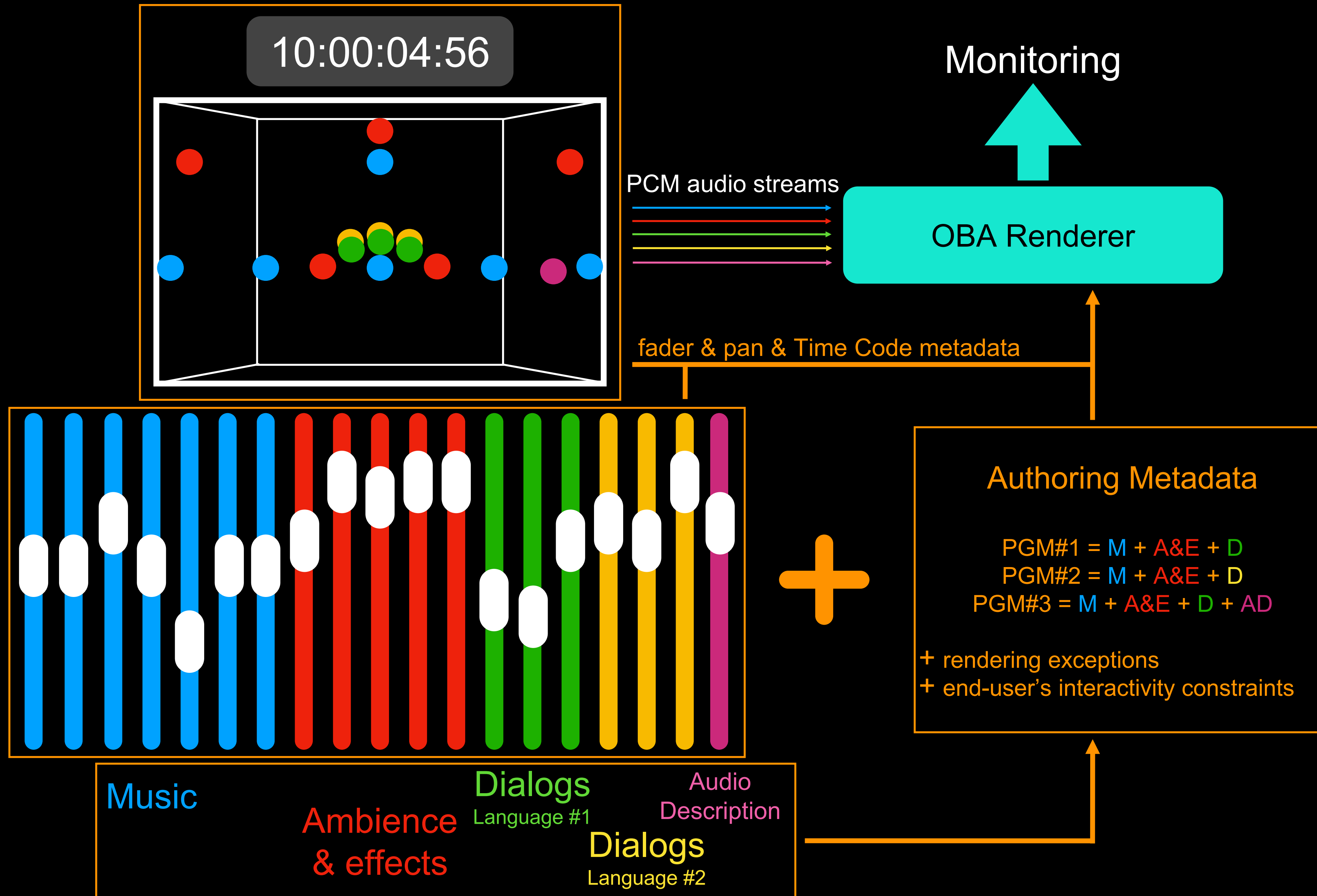
PGM#1 = M + A&E + D  
PGM#2 = M + A&E + D  
PGM#3 = M + A&E + D + AD

- + rendering exceptions
- + end-user's interactivity constraints



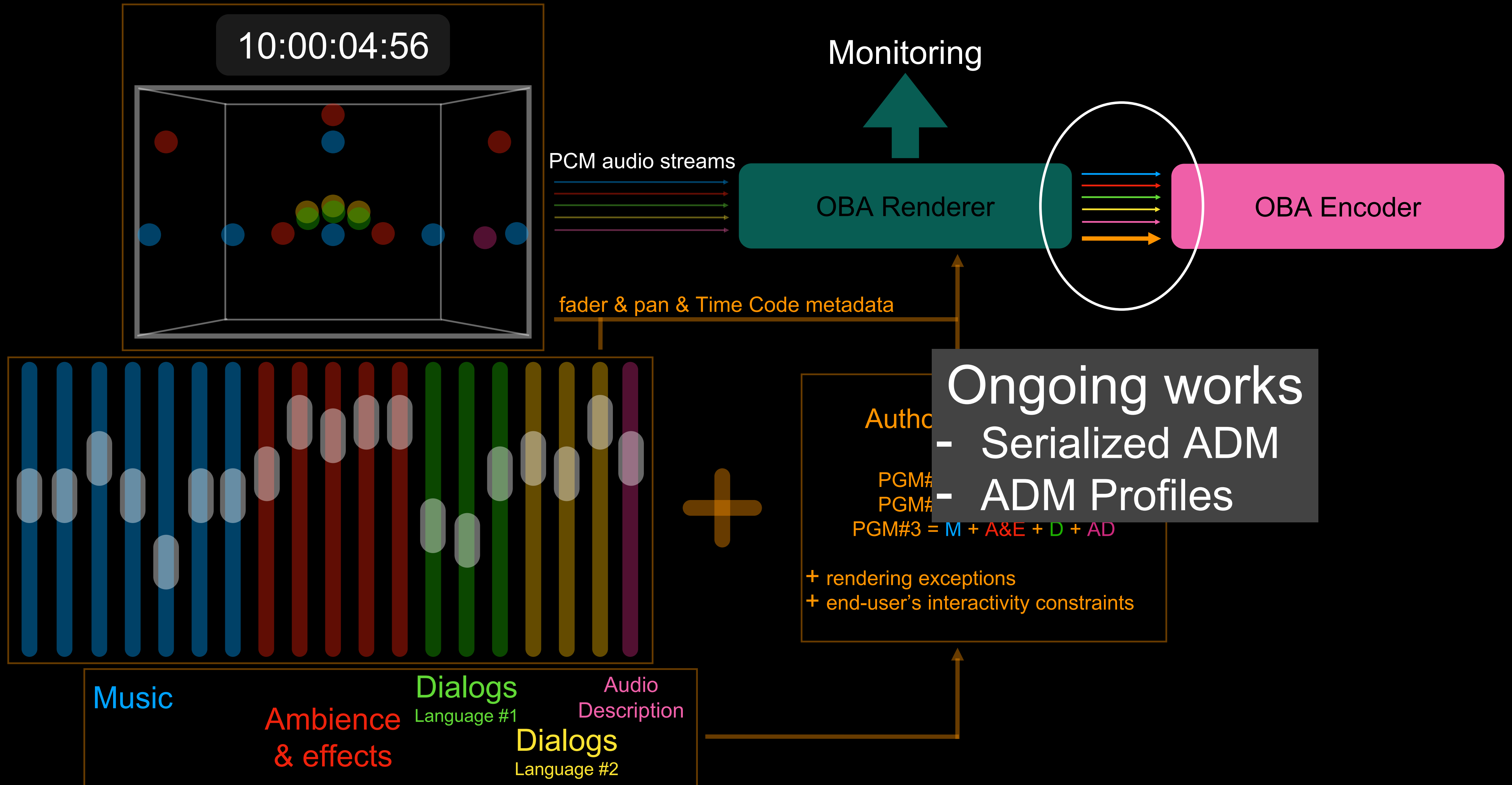


# Object Based Audio production

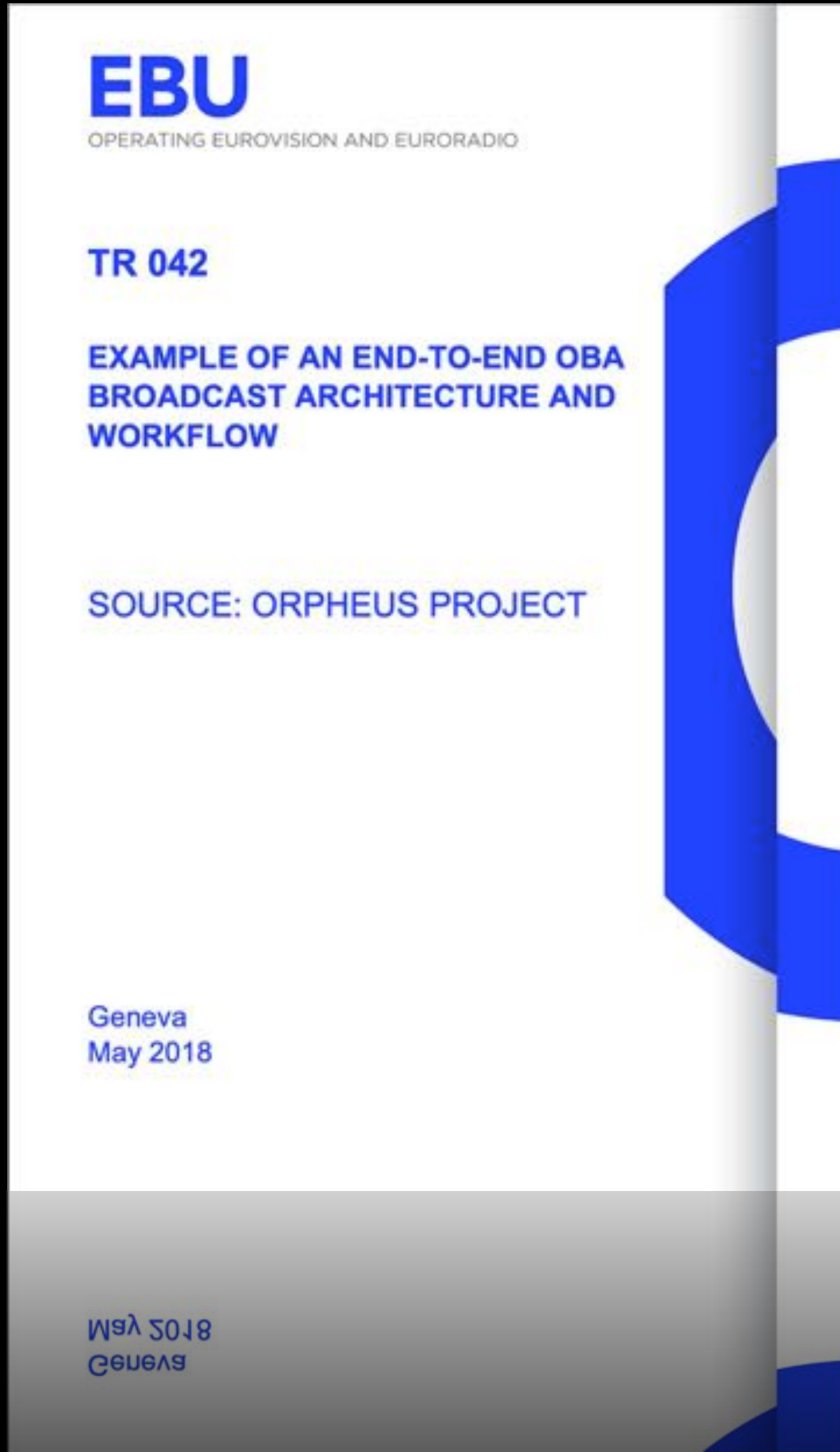


**EAR**  
an open-source  
OBA Renderer

# Object Based Audio production



# Additional publications



# Thank you!

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**france•tv** innovations  
& développements