

ITU-R Workshop
Topics on the Future of Audio in Broadcasting

Movies and the immersive experience

Hubert Henle
hubert.henle@online.de
15.7.2015

Overview

- Adaption of theatrical immersive sound formats
- Options for user interactivity

Overview

Adaption of theatrical immersive sound formats

Options for user interactivity

Adaption of theatrical immersive sound formats

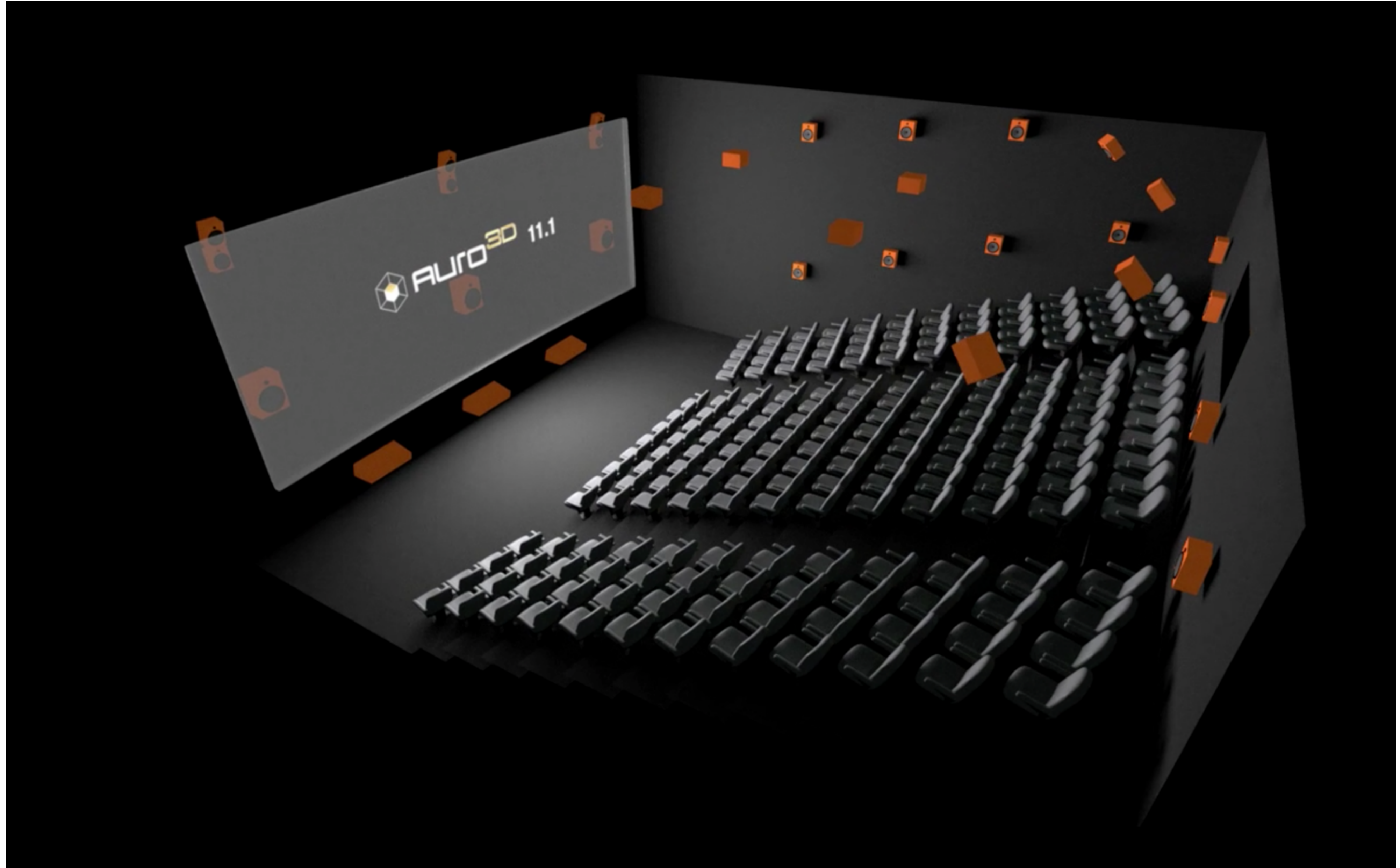
Audio formats currently in use for feature film soundtracks

- Channel based
 - 5.1 (L-C-R-Ls-Rs-SW)
 - 7.1 (L-C-R-Ls-Bsl-Bsr-Rs-SW)
- 11.1 Auro 3D (5.1 + 5 Height + 1 Overhead)
- Formats supporting audio objects
 - Dolby Atmos (9.1 + 118 objects, 64 speaker positions)

Non-Immersive

Immersive

Adaption of theatrical immersive sound formats



Adaption of theatrical immersive sound formats



Adaption of theatrical immersive sound formats

Audio formats currently in use for feature film soundtracks

- Channel based
 - 5.1 (L-C-R-Ls-Rs-SW)
 - 7.1 (L-C-R-Ls-Bsl-Bsr-Rs-SW)
- 11.1 Auro 3D (5.1 + 5 Height + 1 Overhead)
- Formats supporting audio objects
 - Dolby Atmos (9.1 + 118 objects, 64 speaker positions)

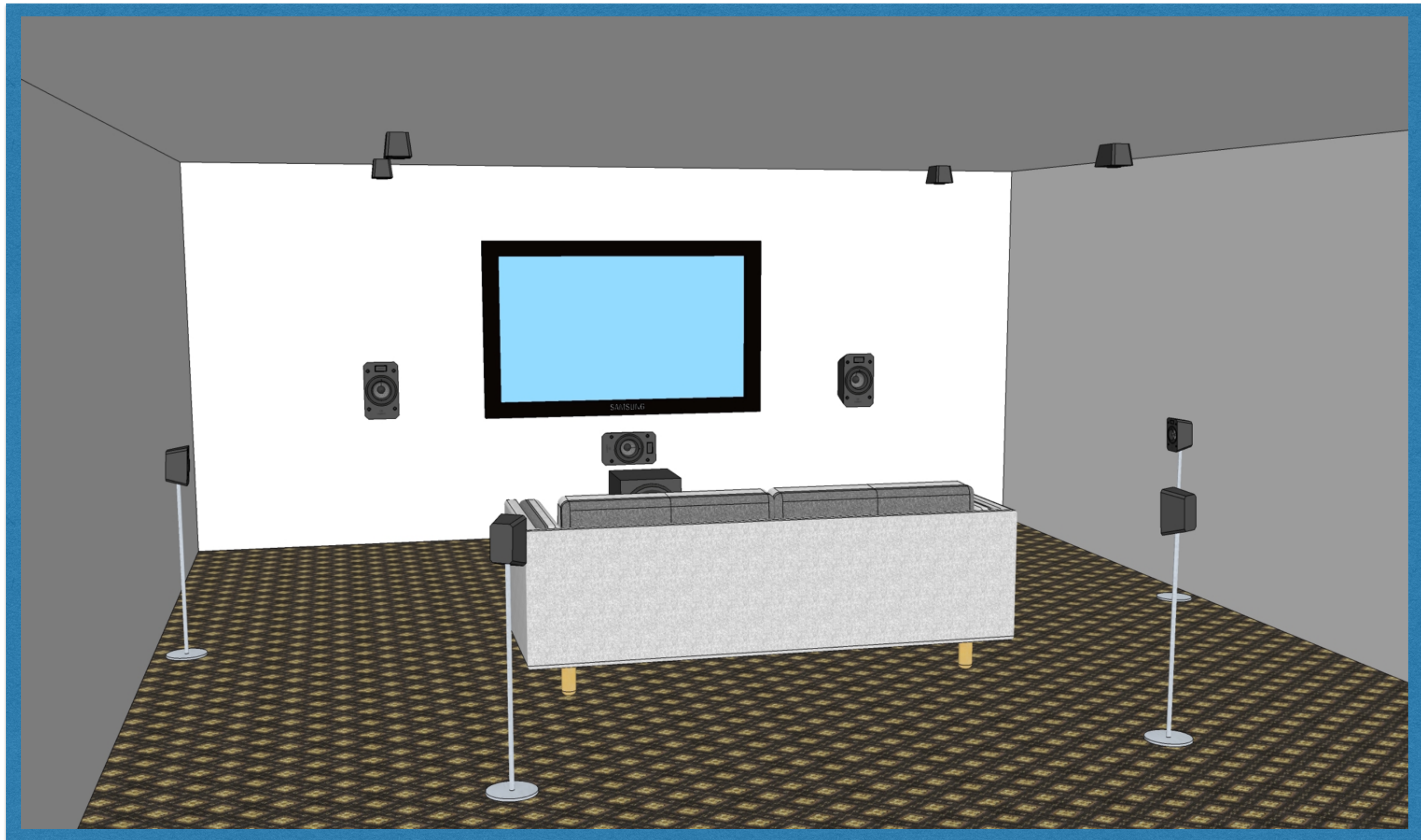
Non-Immersive

Immersive

Challenge: Number of Objects and speakers

- Dolby Atmos supports 9.1 „bed“ and 118 simultaneous objects rendered into 64 speaker locations
- However: Not all objects will actually be dynamic i.e. moving!
- It is unrealistic to replicate this in a consumer format
 - Bandwidth of transmission and playback renderer
 - Speaker resolution

Adaption of theatrical immersive sound formats



Manage Objects

- Pre-Rendering into channel format
- Transform into Higher-Order Ambisonic format
- Preserve (selected) objects

Manage Dynamic Objects: **Pre-Rendering**

- 7.1 + 4 channel format
- Rendering tools for ProTools available
- Full control on production side
- No metadata
- Possibly limited flexibility with speaker placement in the home

Adaption of theatrical immersive sound formats

Manage Dynamic Objects: **Higher-Order Ambisonic**

- More flexibility with speaker placement
- Preserves location information

Manage Dynamic Objects: **Preserve selected objects**

- Conversion of source metadata into MPEG-H format
- Remaining objects processed as described above
- Requires artistic decisions by the content creator

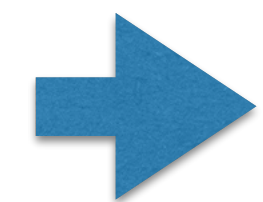
Overview

Adaption of theatrical immersive sound formats

Options for user interactivity

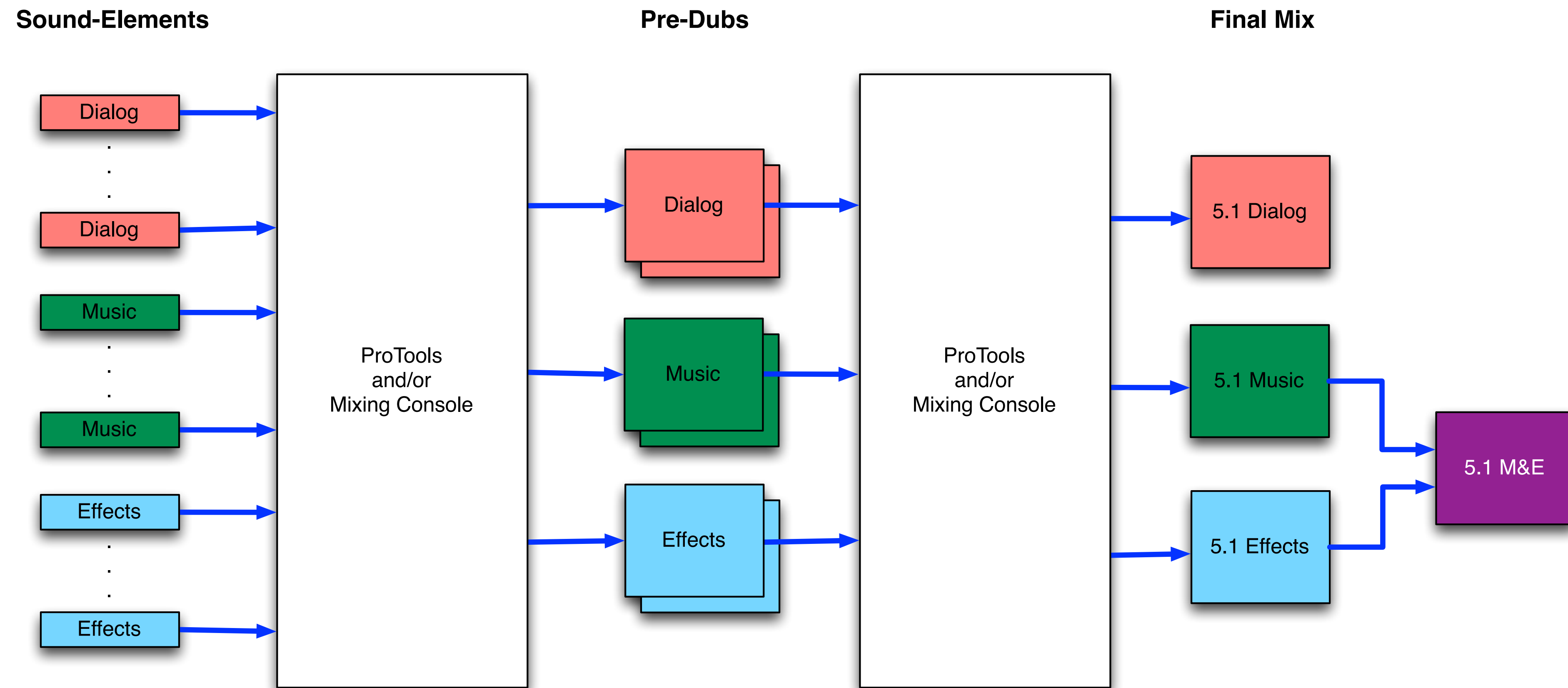
Interactivity for movie soundtracks?

- Rebalance dialogue against music and effects
- Choice between different language versions



Dialogue must be delivered separately!

5.1 Workflow in feature film mixing



Interactivity for movie soundtracks

- 5.1 dialogue and M&E available as standard deliverable from (almost) all feature film mixes
- Dialogue can be delivered as an audio object in MPEG-H
- Bandwidth overhead reasonable

Rebalance dialogue against M&E

- Personal preferences
- Adapt to listening environment
- Simple GUI to allow rebalancing within reasonable limits (set by metadata)

Choice between different language versions

- Multiple language versions in single transport stream
- Alternative delivery methods for additional languages
 - Broadcaster's webpage

Other benefits

- DRC
 - Dialogue and M&E can be processed independently
 - Less prone to unwanted side effects

ITU-R Workshop
Topics on the Future of Audio in Broadcasting

Movies and the immersive experience

Thank you!

Hubert Henle
hubert.henle@online.de
15.7.2015