



Object-Based Broadcasting – For European Leadership in Next Generation Audio Experiences

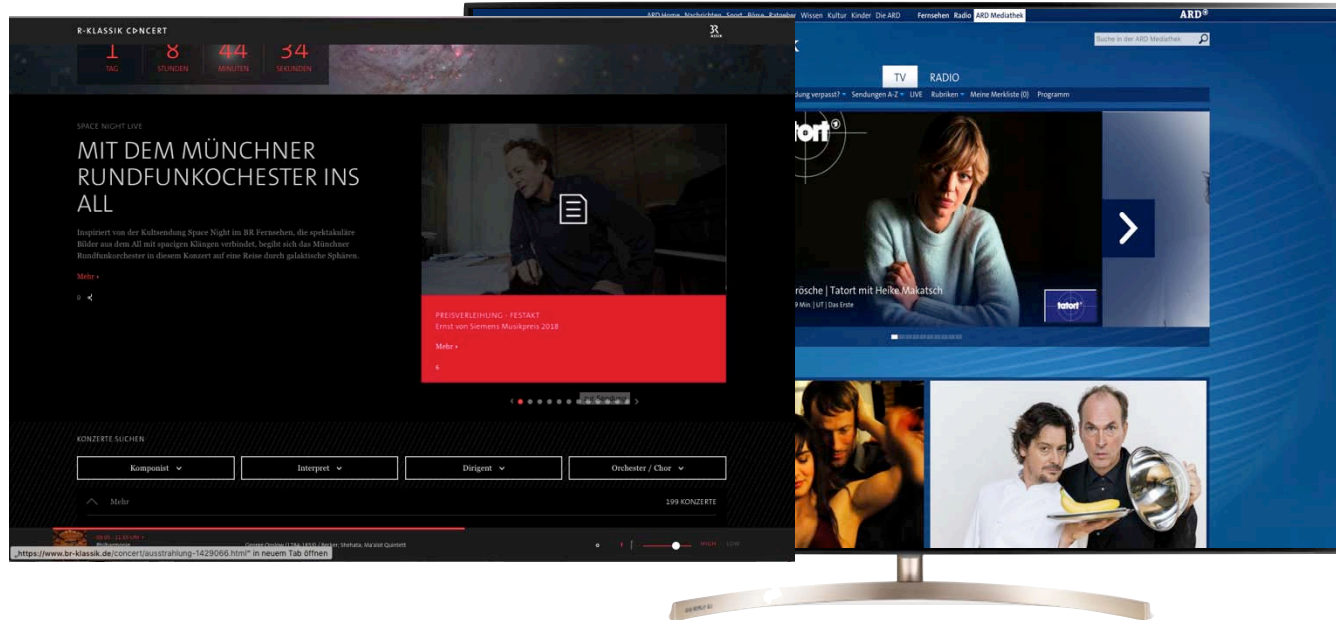
Benjamin Duval, R&D engineer, Trinnov Audio

Werner Bleisteiner, Creative Technologist BR-Klassik, Bayerischer Rundfunk

HIGH END Munich 10-13/05/18

Change in media and broadcast landscape

- ▶ On-demand media
- ▶ Internet distribution

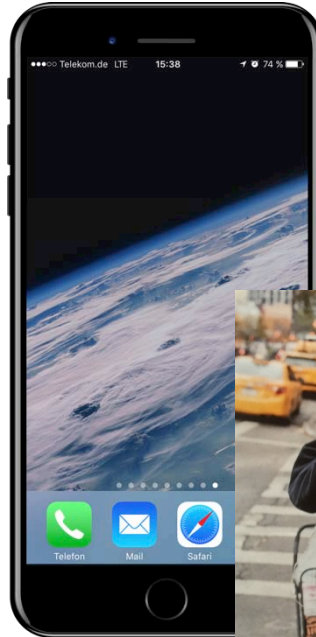


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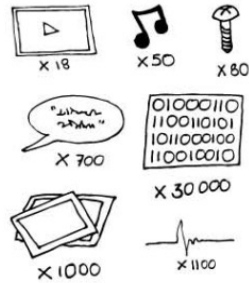
Scaling problems

- ▶ Different devices
- ▶ Various situations



Traditional broadcasting

1



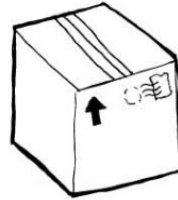
The programme is made in the traditional way.

2



The programme is turned into a piece of linear media.

3



This is broadcast to everyone.

4

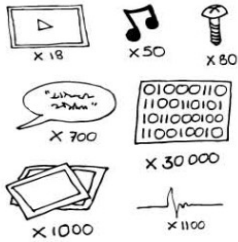


The same content is played back on all devices, resulting in compromises on some devices.

Design: BBC R&D

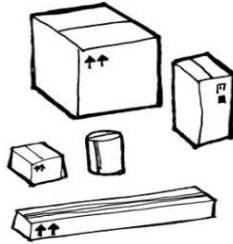
Object-based broadcasting

1



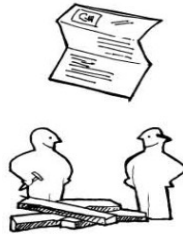
The programme is made in the traditional way.

2



The programme is turned into a collection of media objects along with some metadata to describe how it should be assembled. All of this data is broadcast to everyone.

3



The device inside the viewer's home re-assembles the media objects according to the metadata.

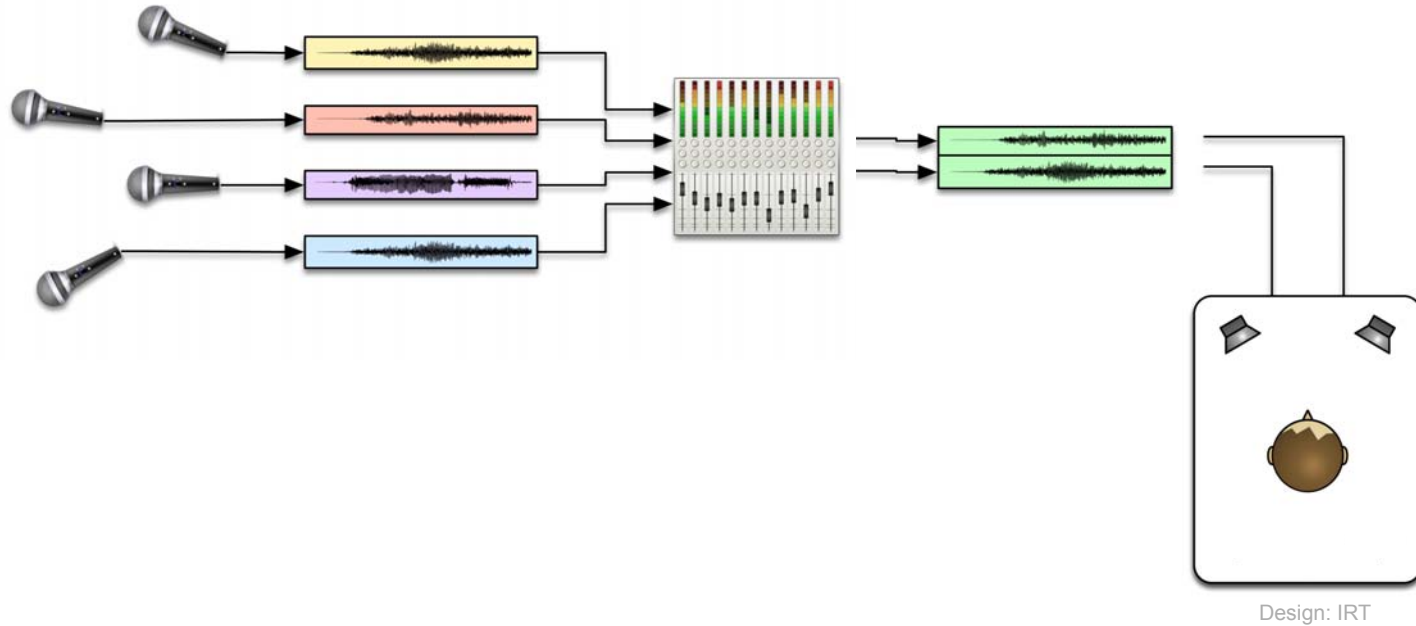
4



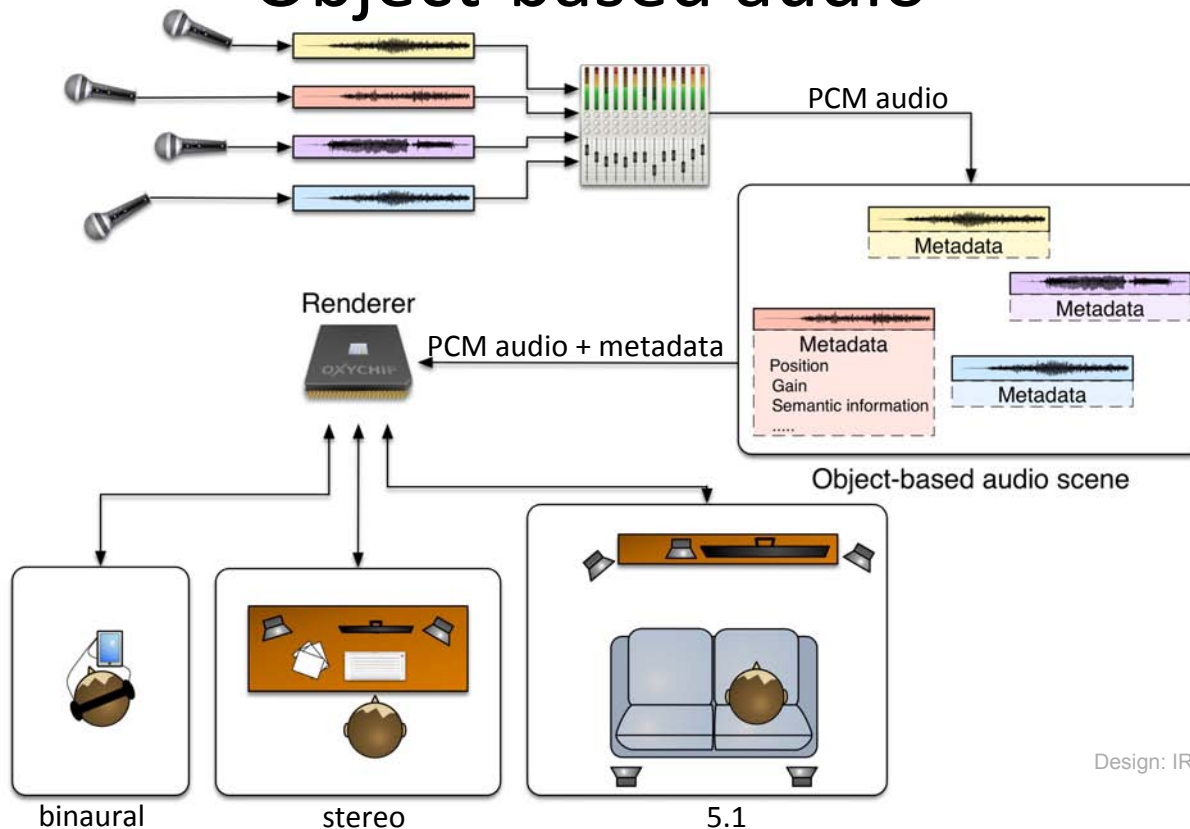
The objects can be assembled differently (based on the original metadata), optimising the experience depending on local factors relating to the device, environment and viewer.

Design: BBC R&D

Channel based audio



Object-based audio



Design: IRT

Object-based audio?

- ▶ It's not (just) immersive or 3D audio
- ▶ It's audio with metadata
 - ➔ Partially recomposed in the renderer device
 - ➔ Allows more interactivity, adaptation...

Object-based audio enables



Accessibility

Immersion

Personalisation

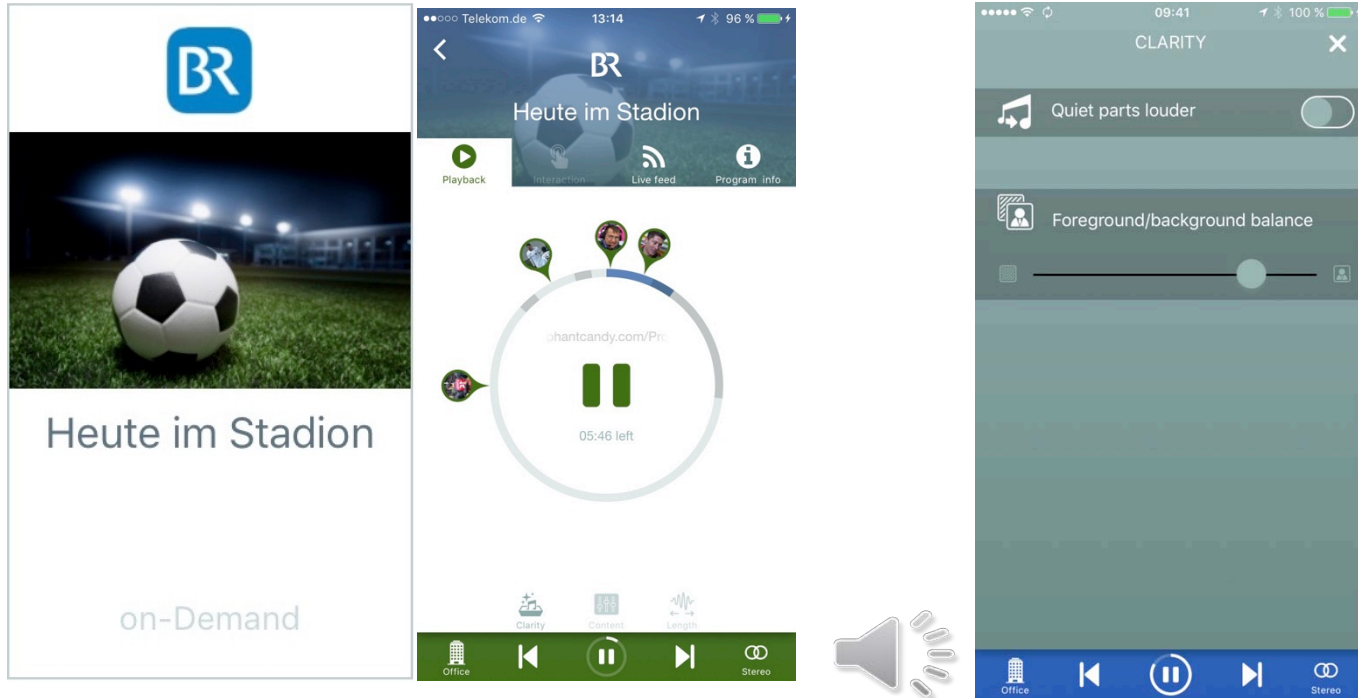
Interactivity

Design: BBC R&D

Accessibility

- ▶ Foreground/background adjustment or prominence balance
 - ➔ Adjust the dialog or commentary level for noisy listening environments

Accessibility



Immersion

W.A. Mozart: Gigue K 574

arranged & performed by

PASSO AVANTI



Stereo



5.1



High scale multi-channel



Binaural



HOA

Immersion

► Adaptation to various rendering layout



Stereo



5.1



High scale multi-channel

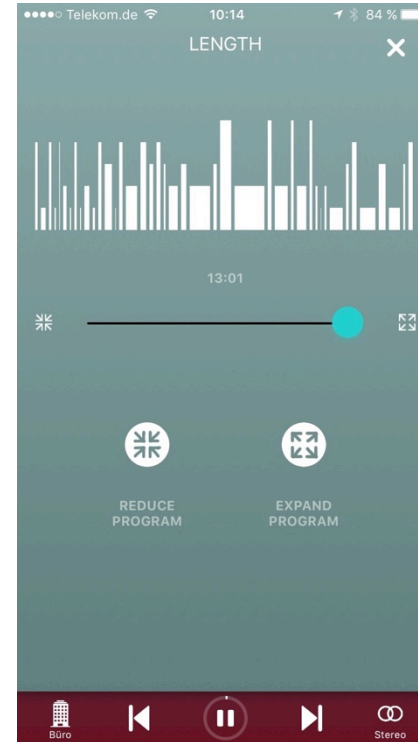
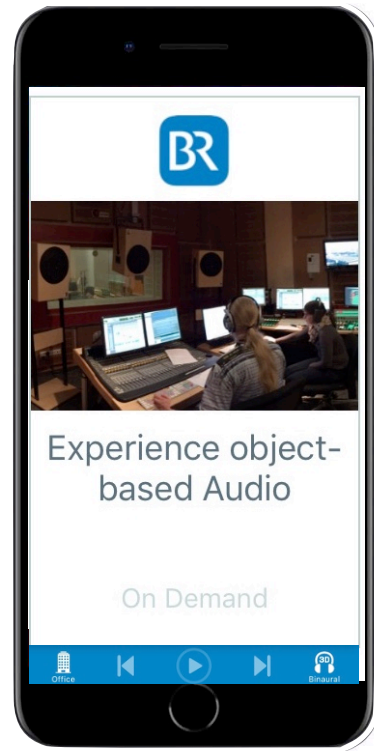


Binaural

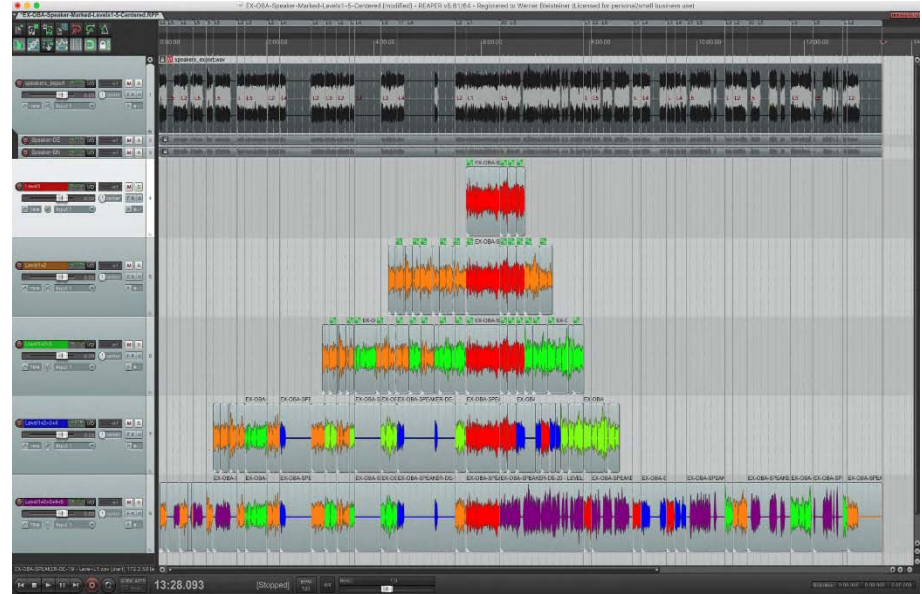
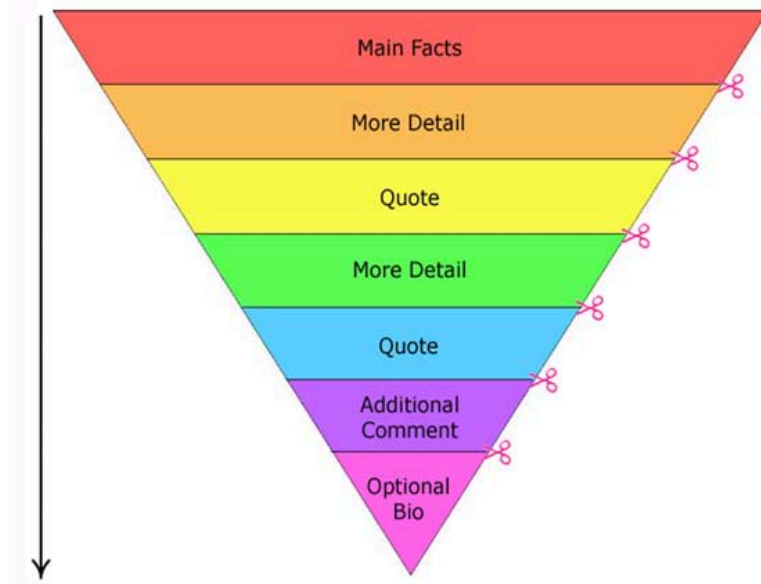


HOA

Personalisation

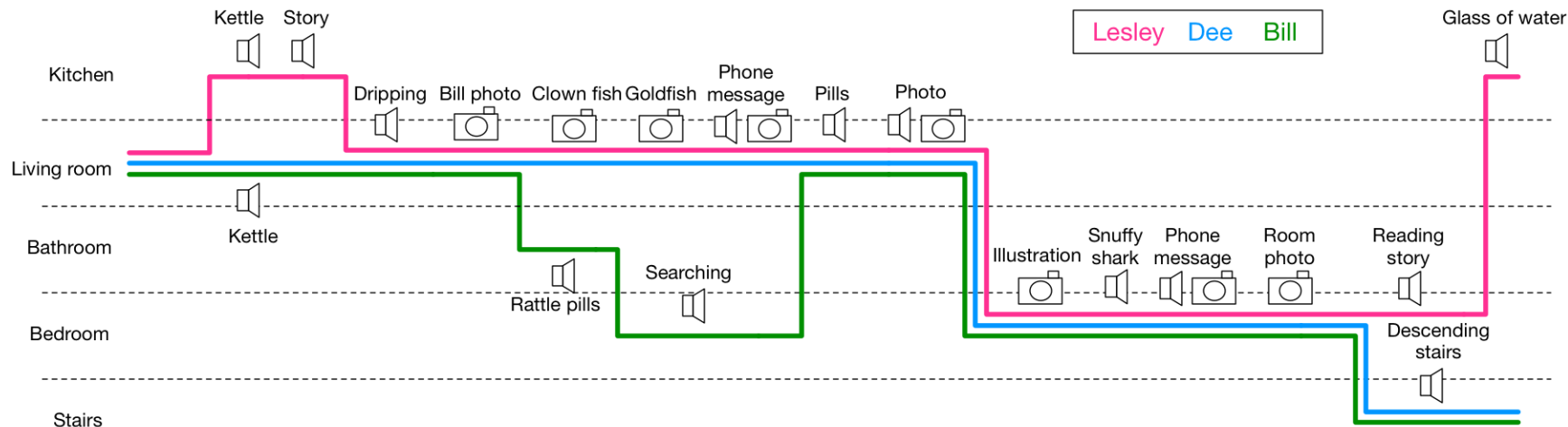


Personalisation

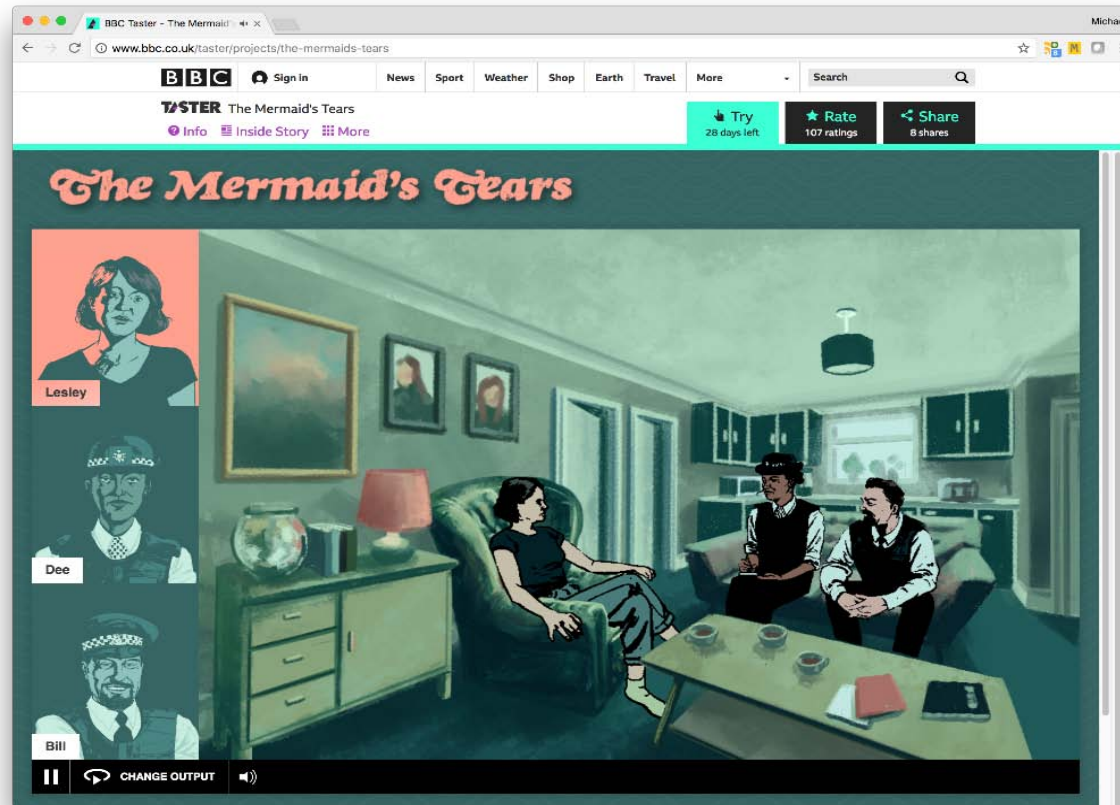


Interactivity

► Multi-layer and non linear storytelling



Interactivity



The ORPHEUS project

Object-Based Audio Experience

Object-Based Broadcasting – For European Leadership in
Next Generation Audio Experiences

10 Partners from 4 countries

Research:



Fraunhofer
IIS



ircam
Centre
Pompidou

b com

Broadcasters:



B B C | R&D

Compagnies:



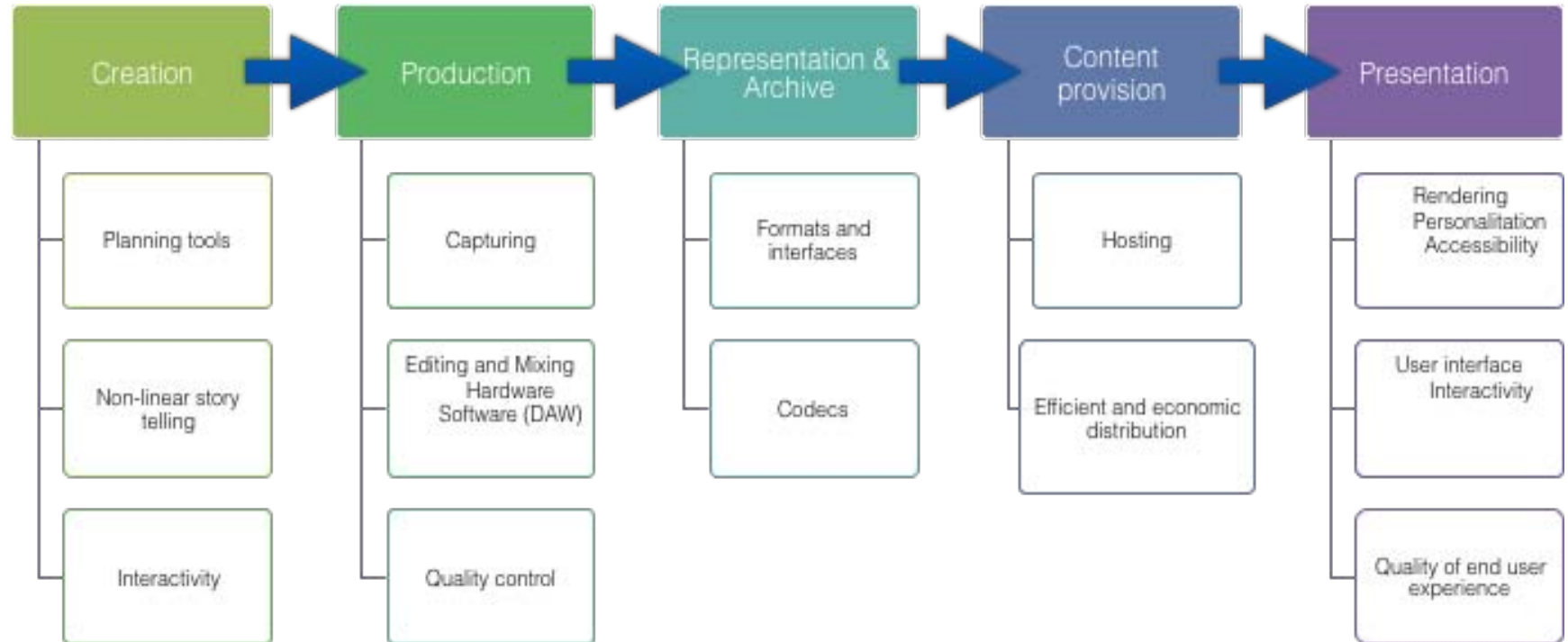
[°°] Elephantcandy

MAGIX

Management:



ORPHEUS: complete chain

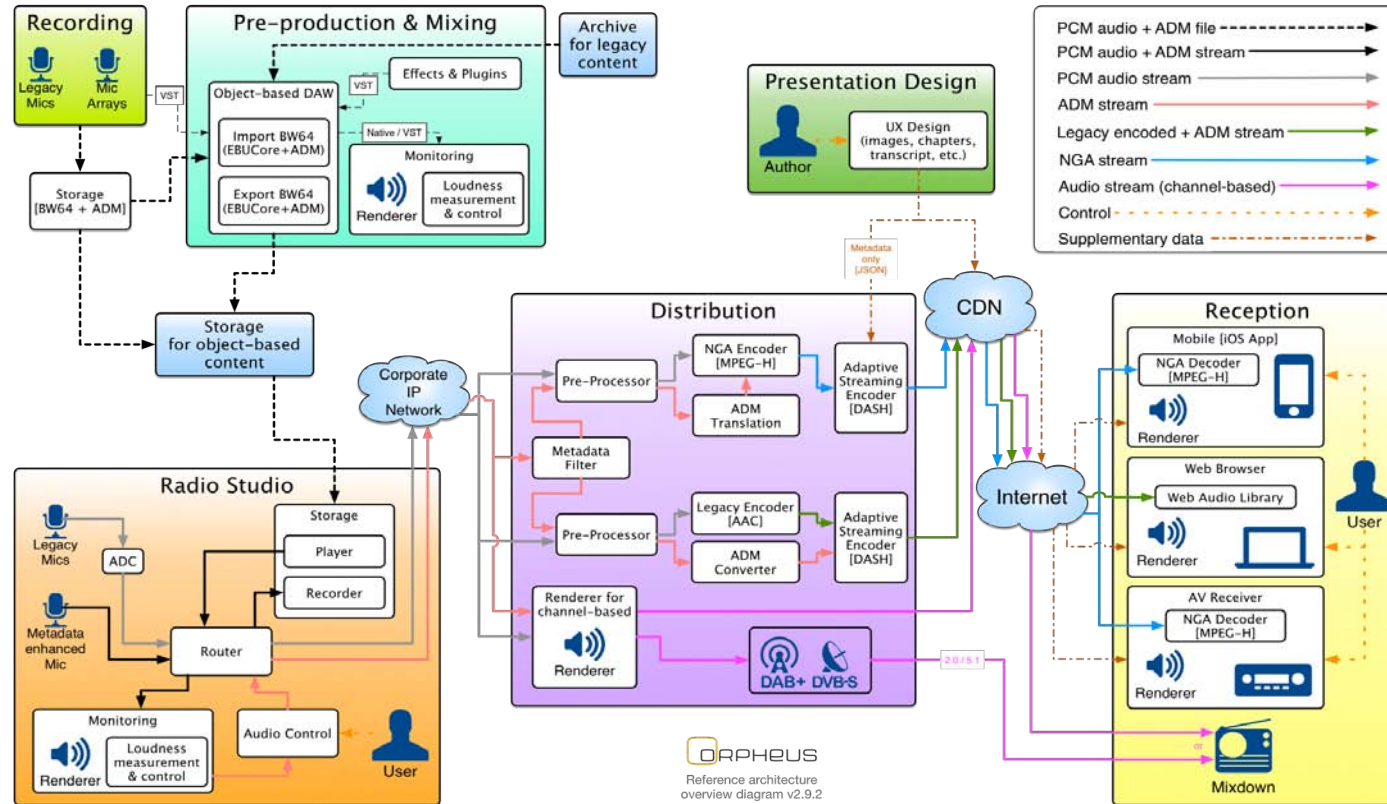


Formats used

- ▶ Professional production format:
EBU ADM (Audio Definition Model)
- ▶ Consumer delivery format: MPEG-H



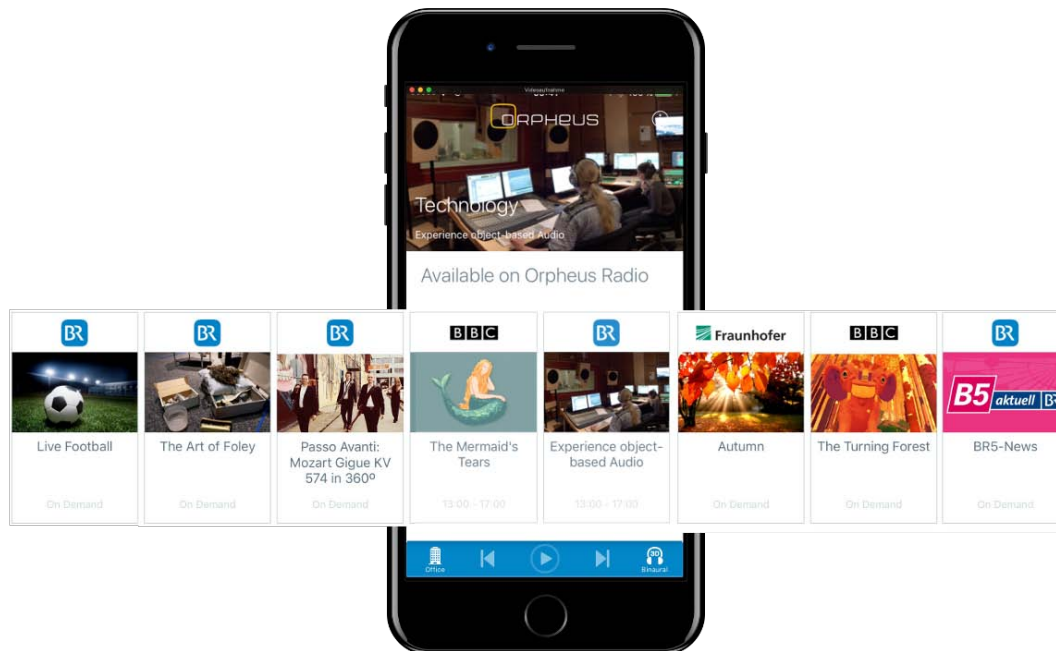
Reference architecture overview diagram



The ORPHEUS studio at the BBC



Mobile device



► ORPHEUS app prototype by elephantcandy

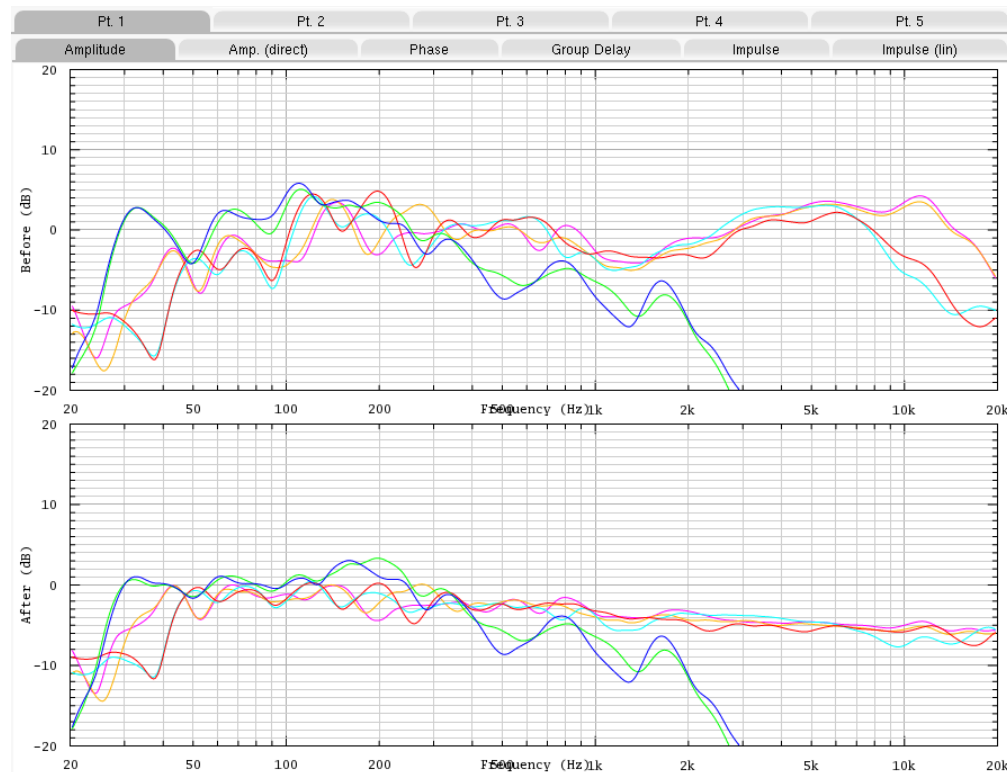
Home-theater use



► Trinnov Altitude32 home-cinema processor

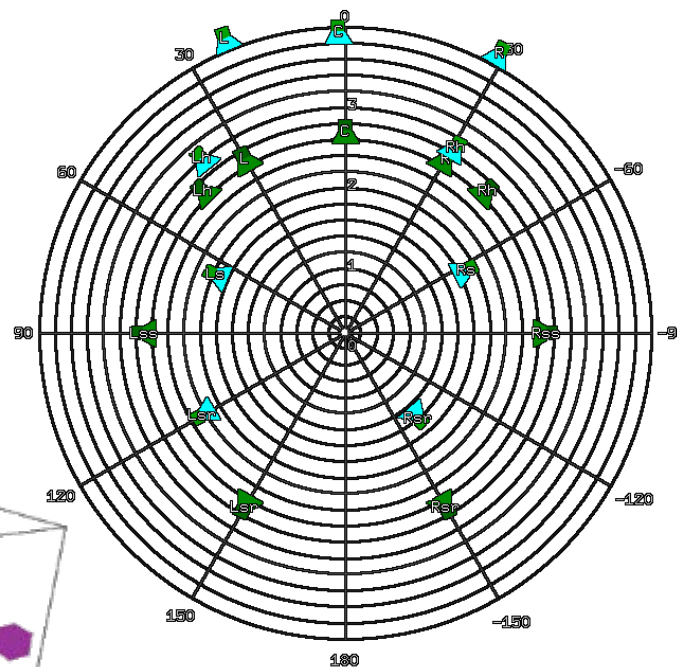
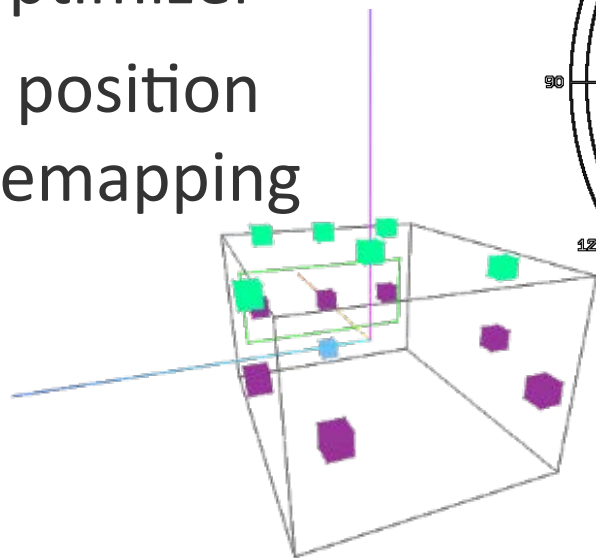
Home-theater use

- Room acoustic correction: Optimizer



Home-theater use

- ▶ Room acoustic correction: Optimizer
- ▶ Loudspeaker position correction: Remapping



Home-theater use

▶ Demo in room Atrium 4.2 – F203

- ➔ Thursday May 10th 17:30
- ➔ Friday May 11th 17:30
- ➔ Saturday May 12th 17:00
- ➔ Sunday May 13th 15:30

Home-theater use

Atrium 4.2
F203



Thank you for your attention!



Find us at www.orpheus-audio.eu

*Twitter: **ORPHEUS_AUDIO***

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