

# tech



## *Video didn't kill the radio star!*

### THE FUTURE OF AUDIO

*Plus*

- DIGITAL RADIO REPORT
  - EBU @ IBC 2014
  - OBJECT-BASED AUDIO & FAR
  - CROSS-PLATFORM AUTHENTICATION
- and more...*

**EBU**

OPERATING EUROVISION AND EURORADIO

[tech.ebu.ch](http://tech.ebu.ch)



Issue 22 • December 2014

- 3 Welcome to the DLR / Upcoming events
4. News
5. News
6. Loudness normalisation
7. FAR group update
8. Immersive audio
9. Satellite interference
10. Video contribution over IP
11. In my opinion
12. Digital radio report
14. An eye on IBC 2014
16. Cross-platform authentication
18. Member profile: RTP
19. In the spotlight: Galina Federova

Cover Story: Simon Tuff story, page 8

© European Broadcasting Union 2014

All rights reserved. The reproduction of articles in tech-i is authorized only with the written permission of the publishers. The responsibility for views expressed in tech-i rests solely with the authors.

Published by the EBU  
Technology & Innovation Department  
17a, L'Ancienne-Route,  
CH-1218 Le Grand-Saconnex  
Switzerland.

Editor-in-Chief: Simon Fell  
Managing Editor: Shannon Frame  
Email: frame@ebu.ch  
Tel: +41 22 717 2745

Design: Louise Tait  
Printed on FSC Certified paper  
by New Goff n.v.



Recent news that Sony is planning to discontinue 1/2" VTR machines, including the HD-CAM SR stalwart of the broadcast industry in recent years, puts me in mind of that over-used phrase 'the tipping point'.

Sony plan to cease selling new machines from March 2016, and have announced globally their intent to carry spares stock for 7 years after this date i.e. until 2023.

What will happen afterwards? If you need to use video tape you will be potentially on your own. Of course many dealers will stock up in the meantime, and there will be some stock parts here and there somewhere in the world. But, reliable supply will cease.

You might argue that we should have all switched to file-based operations by then - and many indeed will have done so - but (and it is a big but) there are many parts of the world that will not have completed transferring their archives onto a digital file-based system by then.

On a recent visit to an eastern European broadcaster, I was surprised to see rooms full of Russian-made 2" video tapes, and a large stock of 1/4" reel-to-reel in the radio archive. Yes, they have some newer file-based systems, but the funds to view, log, and transfer such vast quantities of valuable archive shows in the time allowed simply do not exist. This is probably the predominant situation in developing countries.

When asked, they pointed to the Russian made 2" VTR machines and told me to re-furbish the machines costs as much as \$120k. This is not a feasible option given the financial climate.

Our recent Archives Workshop, held at the EBU the last week of October, brought together a wide range of colleagues from different countries facing such problems to different degrees.

Imagine then how much Betacam/ Betacam SP/Digital Betacam/SX/IMX/ HD-CAM/HD-CAM SR there is in the world, and how many programming departments are willing to throw away the original tapes and rely totally on

digital file based archives? Is the confidence there yet in every part of the organization to trust and rely on the new systems to the extent that people relied on 'good old' videotape?

They were not entirely 'good old days'. For the future, we may say goodbye to drop-outs, goodbye to digital tracking errors and tape damage. I can still remember the backing coming off relatively recent 1" tapes in the 80's, and heads jamming to a stop as you attempted to fast forward a tape that had been stored in just the wrong conditions. Even so, there may still be that nagging doubt in the back of your mind about digital storage, and a reliance on the seeming security (probably false) of a reel of video tape or a cassette. They are squirreled away all over our facilities - maybe even uncatalogued gems live inside the boxes. But, unless we archive this stuff, and track it all down in the next 8-10 years, the means to play it back may become either very costly or not possible without specialist help.

So is this a tipping point in another direction to tape? Are we moving to file based IP infrastructures and digital archives logically stored and filed with fulsome metadata? Will we move from the hand written scrawl in the card index of a cassette? Maybe now is the time to capitalize and crystallize all those digital archive systems you have had in mind over the years? Some would suggest using optical disks, some a raid of raids in more than one site. But does our industry yet have the trust in file-based systems with just enough backups made, and no need to re-visit some dusty tape archive anymore?

Where is the physical representation of a TV programme in the future - is it an SSD card, an SX card, a compact flash, an entry in a database somewhere? Will that MAM system last as long as the VTR did? Is it so easy to find and copy the files, unless you have catalogued it and filed it in an open system? Where will we find the extra staff to generate the metadata? We can only hope that we do not end up on a proprietary solution that is not supported one day.

There will be some interesting problems in the digital archives of the future, as we try to get the best out of our old MAM systems, and recall those great programmes from decades before. So to sum up better get started on your archive as it will take longer than you think.

**Simon Fell**, Director, EBU  
Technology and Innovation

## DIGITAL LIVING ROOM



After much anticipation, the EBU opened the doors to its new Digital Living Room (DLR) just before IBC in September. The room was developed to give staff and Members a place to experience the latest in consumer media technologies in a room resembling what a consumer might have at home.

During the last few months, the space has been used by various groups to showcase different technologies including HbbTV, UHD TV, and cross-platform authentication services. Members have also used the space to share their services and best practice with other Members, and to allow staff to learn from each another.

The mix of technologies will change over time and the Technology & Innovation team are busy preparing demonstrations to inspire and educate us all.

## MULTICAST



## A PROVEN, SCALABLE TECHNOLOGY FOR IP-BASED BROADCAST 24-25 September 2014, EBU, Geneva

Although it has been around for 30 years, Multicast technology is not widely used in the public Internet. To be effective, Multicast needed to be supported by all internet service providers end-to-end, and the incentives for this were often lacking.

On 24-25 September, Multicast enthusiasts came together in Geneva at the EBU Multicast Workshop. Their objective: to discuss how multicast can address technical and business challenges of modern broadband media

delivery, its strategic importance to broadcasters and critically how it can be implemented.

Day 1 began with the history of Multicast. Participants discussed why the technique was developed in the first place and how it has been deployed. In the past, implementers faced a number of challenges when using Multicast. Most technical issues have been solved with the advent of Source Specific Multicast (SSM)<sup>1</sup>, but that has not brought



## Production technology seminar

27-29 JANUARY 2015, EBU, GENEVA

Start your year off well by joining us at the next Production Technology Seminar. This 3-day event attracts more than 100 participants each year and provides an opportunity to take a closer look at production technologies, latest trends, improving workflows, and how to be 'smarter' in the way we produce.

<https://tech.ebu.ch/events/pts2015>



## Digital radio summit & RadioHack workshop

11 FEBRUARY 2015, EBU, GENEVA

Digital radio's annual flagship event. Experts gather for a whole week of radio-based events centred on the Summit every year. It's all about how technology can serve the radio services we love and how these will evolve over time to match the changing listening patterns..

<https://tech.ebu.ch/events/drs2015>



## BroadThinking

18-19 MARCH 2015, EBU, GENEVA

With HbbTV 2.0 around the corner, this EBU event deals with the key challenges and opportunities as broadcasters engage with their audiences in hybrid services, interactivity, second screen, and over-the-top services. Making the most of broadband.

<https://tech.ebu.ch/events/broadthinking2015>

**Metadata developer workshop**  
JUNE 2015, EBU, GENEVA

**Network technology seminar**  
23-24 JUNE 2015, EBU, GENEVA

wide spread adoption of this technology yet.

Enter Automatic Multicast Tunneling (AMT)<sup>2</sup>. This draft IETF standard allows internet service providers to bridge the gaps in end-to-end Multicast by providing a solution to deliver Multicast traffic across a non-Multicast enabled network. It addresses delivery from the core service provider network across the 'last mile' into the user's home. Once in place, AMT enables the service provider to ensure a smooth roll-out of the Multicast-based services.

If Day 1 was about describing the history and outlining the tools facilitating Multicast roll-out, Day 2 was about teaching participants. Participants had the opportunity to get a hands-on explanation of how to implement an AMT client in their own applications. Examples included Open Sourced AMT client software and prototype implementations.

To bring the theory into practice, EBU's Technology and Innovation team, with Members and external partners, are developing an AMT Multicast testbed with practical information and real-life use cases. The testbed is now available via EBU.IO/multicast.

1 [http://en.wikipedia.org/wiki/Source-specific\\_multicast](http://en.wikipedia.org/wiki/Source-specific_multicast). 2 <https://tools.ietf.org/html/draft-ietf-mboned-auto-multicast-17>



ARCHIVES WORKSHOP, 28-29 OCTOBER, GENEVA

PROFITING FROM THE PAST

In his opening speech at the EBU Archives Workshop, Simon Fell referred to "Things to come", the 1936 movie based on the book by HG Wells. That film is a prime example of the predictive powers of audio-visual content. Flat screens, tablets and wrist watches were all featured some 80 years before they actually became available.

The irony is that it is easy to recognise the value of archived material with hindsight, but it often is very hard to predict its value in advance, making it a struggle for many broadcasters to preserve and protect their content. Somebody who knows this all too well is Blago Markota (HRT's Chief Content Officer). At the EBU event he stressed the need to focus on the archive's audience and to provide local contextualisation if the goal is to maximise the archive's value for repurposing. The BBC's Andy Qusted (Head



of Technology, BBC HD & UHDTV) reported seeing a growing awareness by the audience of the heritage locked in broadcaster's archives and have a keen interest in accessing them.

Another part of this great archive debate is the technical requirements. Is there a long lasting and high quality codec

we can use? What about an archive wrapper that can package all the metadata and content together? What QC software to use and when to use it? And the perennial question, where to safely store the broadcast archive? A quick poll on the use of (external) cloud solutions showed a large level of caution amongst the

broadcasters to move in that direction. After all, the archives are the material record of a broadcaster's existence, and are of high value.

The Archive Workshop is just the start of the EBU's journey into the past. This journey will become more challenging than the path into the future, but it also offers an amazing opportunity for all to unlock our heritage.

The EBU T&I department is helping Members as part of the EBU's assistance programme for Balkan region broadcasters and addressing specific archive issues in the Strategic Programmes on Quality Control and IMPS. Feedback from the event will shape future work in this domain. *[Images from: <http://aljote.wordpress.com/2012/10/28/on-the-epic-next-nature-of-sci-fi/> <http://elizabethprata.blogspot.ch/2014/03/movie-review-things-to-come.html>]*

DARE TO BE MORE AGILE

OUTCOMES FROM THIS YEAR'S EBU DEVCON 29 September – 01 October 2014, EBU, Geneva

EBU's developer conference – DevCon – now in its second year was held earlier this month. Speakers from a wide range of companies shared their insights on what makes development teams work: the tools they use and how they are organised. It is all about creating the right culture. Terms frequently encountered were agility, openness, and coaching. Brendan Marsh (Spotify) also stressed the importance of daring to fail because we learn from our mistakes – especially in software development.

DevCon came in a week that also saw the first meeting of a new EBU Strategic Programme on Agile Software Collaboration. This group revolves around EBU Members sharing their development experiences to better meet their software development challenges. The broadcast and the software development philosophies can have a tendency to collide. EBU Members can join the Agile Software Collaboration Group here: [tech.ebu.ch/asc](http://tech.ebu.ch/asc).

The group will also be responsible for next year's EBU DevCon, which will take place on 06-07 October 2015.





## FORECAST

The EBU's annual seminar on broadcast technologies, media delivery and spectrum took place in Geneva at the beginning of November. Nearly 100 participants joined the event, including EBU Members, representatives of network operators, regulatory bodies, policy makers, manufacturers and research labs.

This year's event focused on the future of terrestrial broadcasting. For a number of years now, the terrestrial broadcasting platform has faced challenges and continues to do so. There is an increasing competition between broadcasters, who are trying to innovate, and ISPs, who are trying to extend their broadband coverage to provide better access to consumers. Both want to deliver high quality media content to all types of receivers, including tablets and smart phones.

Both are also fighting for access to the UHF band which provides excellent coverage conditions thus reducing network costs. In addition, broadcasters are facing the release of part of this band, the 800 MHz and probably the 700 MHz. The lobbying from the mobile industry is not letting up and this 'salami slicing' may also affect the rest of the UHF band which is a candidate band for mobile use at the next World Radiocommunications Conference (WRC—15).

For Andre Prah, RTL, there are three key points to guarantee the success of DTT:

- to become a viable and sustainable business model,
- to use top technologies to provide the best quality services to viewers (DVB-T2, HEVC, HDTV and UHD TV in the future) and,
- to have political and regulatory support including access to spectrum below 700 MHz until 2030.

Concerning the first point, the Chairman of the conference reminded that "Public service media use money to make programmes and provide public services, and not the other way round", EBU Digital Strategy Group, 2006. But EBU Members present at the event clearly joined RTL in the other two key points including the broadcast network operators who declared their continuous support, as Lars Backlund stated: "DTT is here to stay".

The broadcast industry is conscious of the need of being at the front of technology and is constantly innovating. The DVB standard already discusses what the next generation of terrestrial standards will look like. And broadcasters engaged in HDTV are already making trials with UHD TV1-Phase 1 in DTT, waiting for Phase 2 to be standardised.

Martin Fenton, Ofcom, explained the WRC-15 studies that relate to the future use



of the UHF band. At the European level, different studies have been done to help European regulators to define their positions. The ECC TG6 report, was presented by Jaime Afonso, Anacom, and the results of the European Commission's Report of the High Level Group, the Pascal Lamy's Report, were introduced by Andreas Geiss, from the EC. More recently, Aetha, a strategic telecommunications consultancy, carried out an independent study, Lee Sanders presented the findings.

The studies converge on a large number of points:

- nonlinear TV consumption is growing but linear TV is dominant,
- nonlinear TV complements linear TV,
- big screen remains important in the house but also many new small screens are getting in the house,
- Wi-Fi offload presents many benefits to deliver high data capacity and,
- DTT is a great European success story and will remain important in the coming years but its future highly depends on spectrum availability. It needs legal certainty and adequate spectrum to face current challenges.

Panellists continued this discussion in the afternoon, focusing on whether or not it would be possible to have a harmonized roadmap for Europe, taking into consideration diverging national situations.

Flexibility was mentioned as a possible solution although each panellist had its own definition. It should not only provide access to mobile services, but also allow DTT to stay if a country decides so.

The second part of the event looked at the growing importance of broadband networks and how broadcasting is evolving to reach its audience with broadband platforms.

Broadcasters demonstrated how they have already started to embrace broadband technologies. Ignacio Gomez, RTVE, presented the Spanish HbbTV roadmap. Sébastien Noir, RTS, gave the latest news on cross-platform authentication. And, Matt Hammond, BBC, spoke about the opportunities of companion screens (or second screens) in the house.

The future of radio was also discussed in the afternoon. With the switch off of FM services ahead in some countries, the future use of Band III and the cost savings of DAB+ compared to FM services were hot topics.

The event highlighted the challenges ahead for terrestrial broadcasting and how complex the decision process is as the number of stakeholders involved is enormous. Broadcasters urgently need to make their case for terrestrial broadcasting to national regulators to ensure that the outcome of important decisions to be made next year provide the regulatory certainty that the broadcast industry needs.



# The state of loudness normalisation in Europe

**FLORIAN CAMERER**, ORF AND CHAIRMAN OF THE PLOUD GROUP, GIVES A BRIEF OVERVIEW OF LOUDNESS NORMALISATION SINCE THE PUBLICATION OF THE LOUDNESS RECOMMENDATION IN 2010

**W**ith the publication of the EBU loudness recommendation R 128 in September 2010, the starting gun went off for an unprecedented change in the audio landscape in broadcasting. What sound engineers were used to work with as a metering and mixing device (peak programme meter) was replaced by a loudness meter – a meter that approximates reasonably well what we hear. Based on the international loudness algorithm ITU-R BS.1770 (currently in its 3rd revision), R 128 was taken up across Europe with great speed. As of 2014, the majority of countries in Europe have either fully switched to loudness normalisation or are in the process of doing so. This is a milestone in audio for broadcasting!

Since 2010, R 128 has had two revisions. The first revision adopted a slightly lower relative gate threshold (-10 LU compared to the original -8 LU, developed by the PLOUD group), as agreed to by the ITU. Consequently, the gate solution (in place to help loudness normalisation of dynamically mixed programmes) is now an International Standard and has been adopted in all other recommendations that reference ITU-R BS.1770 in the world.

The second revision of R 128, published in June 2014, clarified the tolerance around the target level of -23 LUFS. The +/-1 LU tolerance for live programmes stayed the same and a general tolerance of +/-0.5 LU was introduced for everything else. This is a useful addition, as the meter itself has a measurement tolerance and the metering error can accumulate when several loudness meters are used in the course of a production and quality control process. This is now taken care of by the new tolerance.

In regards to the loudness meter, the main ingredients of the 'EBU mode' have officially been adopted by the ITU into their recommendation ITU-R BS.1771-1: *Requirements for loudness and true-peak indicating meters*. This concerns the momentary meter (integration time = 400ms) and the short-term meter (3s). There still remains a difference to be sorted out: for instance, the momentary meter is calculated passing the un-gated loudness measurement through a first-order infinite impulse response (IIR) low-pass filter with a 400 ms time constant for the ITU document. In R 128, the momentary meter is using a 'sliding window' (FIR) filter.

The two methods are distinct and have different meter ballistics as a result. Jon Allen, a Master's student of Luleå University in Sweden, is currently performing diverse tests on the different ballistics of the momentary meter. The EBU PLOUD Group hopes to gain valuable insight from this work which will potentially lead to harmonisation of the momentary meter behaviour. The differences are not big, but one worldwide standard would be appreciated. Currently, the FIR-version is the de-facto standard (several manufacturers have implemented some ballistic behaviour anyway).

One of the areas subject to further revision is advertisements/commercials. In the original (and still current) version of *Tech 3343: Practical guidelines for production and implementation in accordance with EBU R128*, a first suggestion to limit the potentially high dynamics of commercials uses a permitted maximum for short-term loudness of -20 LUFS (or +3 LU on

the relative scale). Despite careful wording, this limit has found its way into several delivery specifications (some that do not only apply to commercials). This was unfortunate and the EBU PLOUD Group felt that a strong countermeasure was needed.

In due time, (the document is currently under revision) the PLOUD Group will publish a supplement to R 128 which specifically targets production of short-form content (advertisements, commercials, promotion, interstitials etc.). The permitted maximum value of short-term loudness is raised to -18 LUFS (or +5 LU on the relative scale) and the permitted maximum value for momentary loudness is kept at -15 LUFS (or +8 LU on the relative scale). The rise of the permitted maximum for short-term loudness has its cause in feedback from advert production companies in several European countries and was anticipated to happen in the first place! As another clarification, the parameter Loudness Range (LRA) is not specified for short-form content – there are too few data points for a reasonable result in the calculation of this parameter (which uses the short-term loudness values).

LRA, in general, is under debate – it has always been a parameter to be used by mixers to help them get a more thorough idea of the dynamic properties of their mix. LRA was not intended to be used as a maximum limit in delivery specifications. Unfortunately, this has not happened. Therefore, the EBU PLOUD Group is also preparing countermeasures in this area. This will be in the form of the next revision of Tech 3343, and not a separate document.

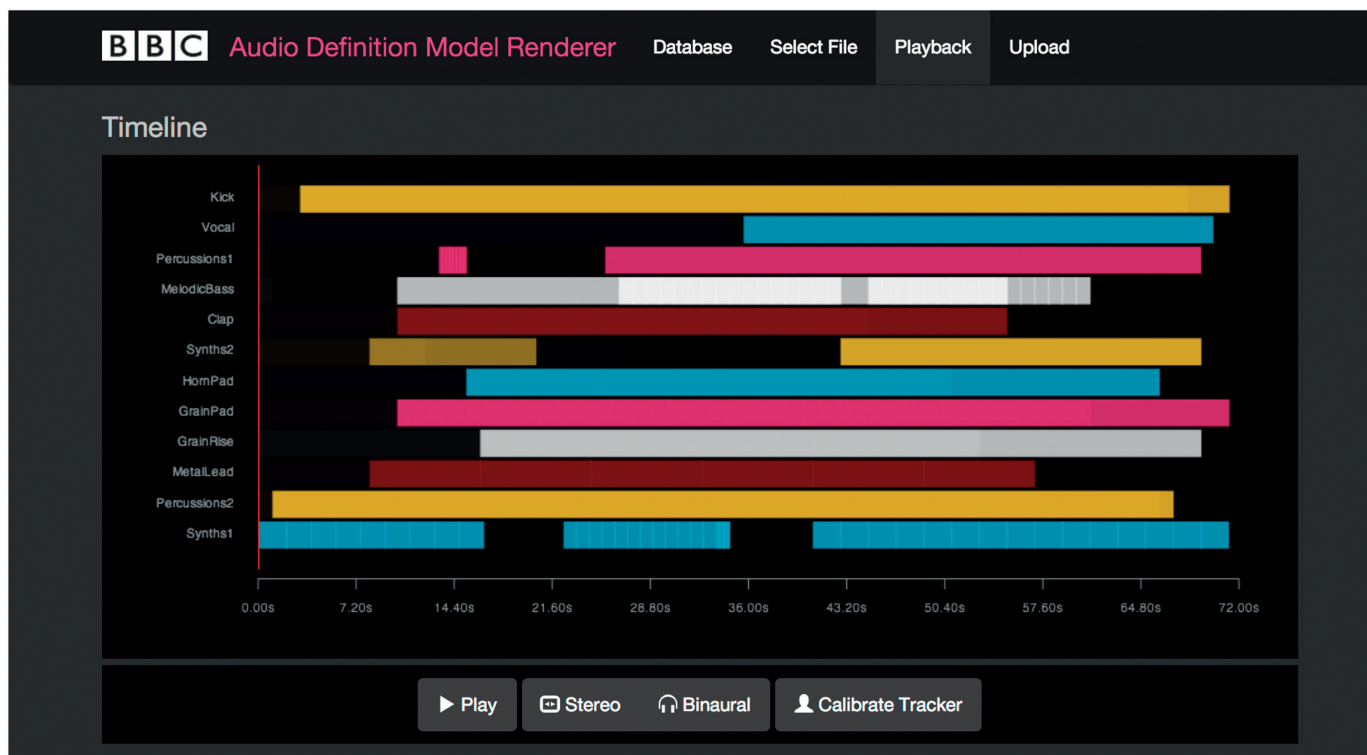
Speaking of the EBU Tech Document, a new version of all four Loudness Tech documents will be published by the end of the year. Tech 3341 ('EBU mode') and Tech 3342 (LRA) will see minor adjustments and some major additions to the test signals. Tech 3343 (Practical guidelines) will be changed significantly compared to the first document. In particular, it will reflect the more mature loudness situation of the present time. Tech 3344 (Distribution guidelines) will be much shorter than before, by nearly 50%, to make the document more accessible. Watch out for these revisions as they provide valuable up-to-date guidance.

In other news, the radio sub-group within PLOUD is working on a document to introduce loudness normalisation in radio. The radio landscape is more heterogeneous than TV and presents new challenges (like the proliferation of FM broadcasting). Nevertheless, some broadcasters are gearing up to switch to R 128 also for radio, and the group is eagerly awaiting their experiences.

Members of PLOUD are also active in the regulation of Personal Music Players (PMPs), an area directly linked to streaming, where loudness problems are still widespread. For example, a few Members are working to help movie theatre owners to systematically control the severe loudness race happening in present day film-making and help their audiences to enjoy movies again without 'bleeding' ears or too low dialogue levels.

There is plenty to do in the loudness world. The EBU PLOUD Group is working behind the scenes to introduce this new revolutionary metering and mixing concept in many other areas. Keep your fingers crossed!





▲ THANKS TO OBJECT-ORIENTATED AUDIO, INTERACTIVE INTERFACES ENLARGE THE CONTENTS CREATION. HERE, CONTROLS ARE OFFERED WITHIN THE WEB BROWSER TO PERSONALIZE THE LISTENED MIX.

## Object-based audio and FAR

**MATTHIEU PARMENTIER**, EBU-FAR CHAIR, TELLS US MORE ABOUT OBJECT-BASED AUDIO AND WHY IT WILL BE THE FUTURE FOR AUDIO SYSTEMS

After the analogue/digital switch, the design and success of the virtual mixing desk and the worldwide adoption of loudness measurements, the world of audio is still challenging. In particular, home-cinema adoption remains very low, mobile listening is growing fast, immersive audio is on the rise in Hollywood, audiences are getting older and transmission bandwidth is always inadequate.

Object-based audio can be considered the next big thing. It allows many different applications and pushes the boundaries of the listening experience.

Thanks to Dolby Atmos®, object-based audio took off in cinema. It has no constraint on bitrate and each sound source (i.e. mono, stereo, multichannel dialogue, ambiance, Foley, music) can be considered as a single object with its own parameters (such as azimuth, elevation, distance from the listener, level, dynamic, spectrum, reverberation). To summarize how the cinema industry handles object-based audio, it appears as similar to recording sources from the mixing desk just before panning and mixing functions.

This means that each theatre must be equipped with a rendering engine to pan and mix audio objects and then address the transducers (loudspeakers).

Object-based audio in the broadcast domain appears differently. Consumer devices cannot handle a high number of objects. Nevertheless, several applications arise, using just a few objects:

- Accessibility services: for example, the speech intelligibility process, clean audio (manual adjustment of dialogue level for the hearing impaired) and audio description (additional commentary for the visually impaired) can easily be realised

if dialogues and commentaries are sent as separate objects.

This is because the rendering engine can adapt the content to the level and nature of the reproduction environment's noise and listener's activity;

- Immersive audio: additional layers such as rear and height speakers could be used by consumers equipped beyond stereo. The rendering engine can automatically adapt the content to the loudspeaker or headphone system that is available;
- Alternative audio: alternative commentary/dialogues could replace the original, offering translation, pure ambiance sound or team-oriented commentary during sport events;
- Alternative editorial versions: where the content of the programme is adapted according to listener interest or time available to listen (e.g. variable length radio documentary).

From a strategic point of view, object-based audio production opens additional features that can help reduce broadcasting costs while offering additional customised services to each consumer.

Thanks to IP networks and interactive services, object-based audio may also enhance marketing studies. For instance, it would be interesting to look at how many consumers need accessibility services, immersive audio and/or original language? Which content, which device, when/where are they concerned?

Object-based audio, especially in the broadcast domain, is still under investigation. The synchronization of objects coming from different networks, the coding schemas and the creation of proper tools for live and post-production will drive several research projects in the next four years. The time is now for broadcasters to map the future for audio is now.



# Why is audio an important aspect of UHDTV?

**SIMON TUFF**, CO-CHAIR OF THE FAME AUDIO SUB-GROUP & BBC PRINCIPAL TECHNOLOGIST, LOOKS AT HOW THE NEXT GENERATION OF BROADCAST AUDIO IS PROGRESSING FOR UHDTV.

Everyone seems to be aware that an ultra-high definition version of television (UHDTV) is on the way and that it has about 4 times as many pixels as 1080p high-definition television. You probably also know the other elements needed to turn this into an implementable and useful UHDTV standard. These include a higher dynamic range [the range of light to dark], better motion portrayal (through a higher frame rate), richer colours (via an enhanced colour gamut), and possibly even more detail with more pixels (the Japanese Super HiVision system, which has 16 times the number of pixels of 1080p, often called 8k). But, not everyone is aware that the development of an advanced sound system is also underway. What might this system be? What will it include? This article will give a review of the progress being made for advanced audio.

## Why is the sound experience different?

First, it is worth recognising the difference between the way we experience audio and video. You can view and make sense of several video images simultaneously. The image [even with very large screens] is bounded and is generally 2-dimensional wherever you sit. Gaps in the video do not completely disrupt your understanding and if the video image distorts it is merely annoying. In comparison, it is really difficult to make sense of several independent audio signals simultaneously. Stereo audio is an unbounded experience (if you are seated in the right place) and gaps in the audio quickly diminish your ability to comprehend what's going on. Furthermore, if the audio distorts then it can be physically painful.

## What should we consider to improve the audio experience?

The differences mentioned above show us that a number of factors must be considered to improve the audio experience. Below are three areas to consider.

1. We know interaction is increasingly valued by audiences but the audio equivalent of a second screen does not work. So, how do we create interaction that is more sophisticated than just the

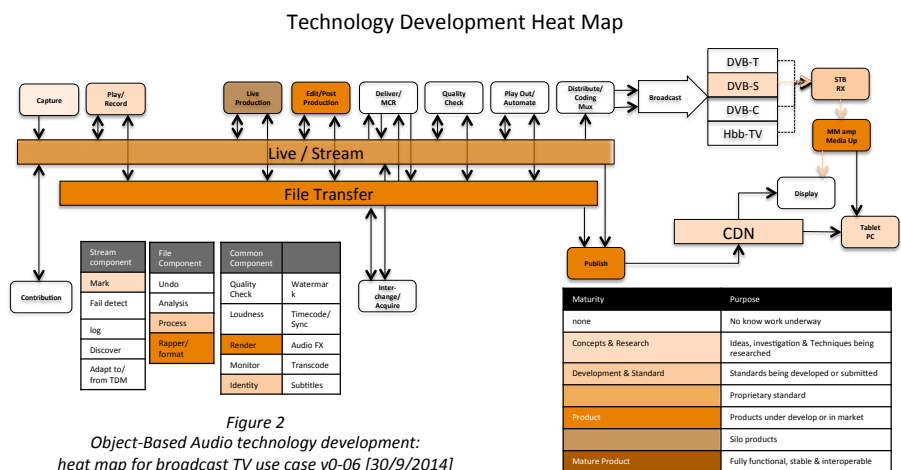


Figure 2  
Object-Based Audio technology development:  
heat map for broadcast TV use case v0-06 [30/9/2014]

- volume control?
2. Audio is already immersive but can we make it more so? Can a truly 3D audio experience work in a way that stereoscopic 3D pictures cannot? Just as important, can we deliver this more immersive experience without burdening the production and distribution process with added complexity and cost? And finally, can we do this in a way that is still accessible to those listening in mono, stereo or on headphones?
  3. Audio quality is actually important. Our ears are very discerning but (perhaps because of this) we also find that audibility and dialogue clarity are a challenge, especially for those with impaired hearing [an increasing issue with Europe's aging population], or those listening in noisy environments. How can we adapt and personalise the audio experience to ensure that it works well for different preferences, a range of technologies, and a variety of listening environments.

## The next generation: So how do we do it?

A range of different techniques are being explored to deliver the three key areas mentioned above: interaction, immersion and adaptation (also called personalisation). The technique seems to be able to do all three, while providing backwards compatibility to current channel based techniques, is object-based-audio. We discussed this format back in Issue 15 of tech-i. Since then, the technology has

continued to mature and standards have been developed.

In our case, the term object-based is increasingly used to describe an overall audio presentation made up of individual audio assets (or objects), each with metadata describing its relationships, behaviour and associations. This metadata tells a renderer in the AV system how best to assemble the objects into the desired presentation with the loudspeakers available.

Conceptually, this is an amazingly powerful and flexible approach, but to develop practical implementations we need to know which problems we want to focus on solving first. To this end, DVB has set up a working group under the Commercial Module of Audio Video Coding (DVB CM AVC) to define the use cases that our next generation audio system will have to satisfy. Fortunately this group can draw upon previous work, including a useful recommendation from the ITU on advanced sound systems which describes practical speaker configurations and the relationship between channel, object and scene-based solutions.

## Developing concepts and solutions

One of the key concepts of the object-based approach is the renderer. The Forum for Advanced Media in Europe (FAME) has developed a useful definition, as shown in Figure 1.

As this definition suggests, it will most likely be necessary to transpose between different object-based presentations. This is



because it is expected that high end drama productions will want to work with a large number of objects (possibly a hundred or more). Live workflows will handle a smaller sub-set of objects and bandwidth constraints will necessitate the use of fewer objects still for delivery to the home.

We also need to be able to assess the performance of different rendering implementations. As yet, we do not have a quality assessment technique that will allow such judgments to be made. Familiar techniques like Multiple Stimuli with Hidden Reference and Anchor (MUSHRA) are not valid here as we are now trying to assess 'immersive-ness' rather than impairment.

This definition also makes it clear that for the renderer to render, it needs both audio and metadata. An EBU team has been working on defining such a data set by producing an audio definition model which defines how object-based audio can be applied to broadcast wave format files, for example.

The very nature of such a flexible approach is that renderers can be developed to take a single published version and implement it in the best way possible for a range of platforms, devices and situations. If this is the case, we now have a new challenge because, as a result, the creative team has far less an idea of how their programme sounds in the home. This raises

the question of whether we need benchmark renderers and monitoring setups to allow a representative assessment for use in production. On top of reproducing object-based audio in known "professional" loudspeaker configurations we have also set the renderer designers the even trickier challenge of how to produce a great sound when presented with the familiar asymmetric speaker layout of the home.

#### What next?

The industry recognises that audio technology and video technology standards and timetables will need to be coordinated, but different. We are already seeing implementations of next generation [4k] TV sets but with only current generation audio solutions for broadcasting. The EBU acknowledged this in November last year at its UHD TV Voices and Choices Workshop, where it was suggested that next generation audio systems might be ready for Phase 2 of UHD TV for use in 2017.

This is not necessarily a bad thing as the audio solutions that are now emerging are not bound to UHD TV and could equally be deployed as a revision to current TV or optical disk standards, or in their own right as new radio or streaming formats. As a consequence, we are now seeing object-based technology emerging in many places.

Dolby has objects at the heart of its Atmos® solution for cinema (including home-cinema) and is introducing its object-based technology as part of its AC4 standard. DTS have opened up their Multi-Dimensional Audio (MDA) format. Fairlight has implemented both Atmos® and MDA in its 3DAW audio tools. The BBC demonstrated object-based examples of immersion, personalization and interaction at IBC this year and MPEG-H has been made "object ready" to deliver not only 3D audio for broadcasting, but also for gaming and video conferencing.

In order to try and understand where all these development leave us, the FAME audio sub-group has developed a simple model of the broadcast ecosystem, as shown in Figure 2. This tries to show functional and operational components, as well as the infrastructure and shared services needed for a full TV broadcast chain. The colour indicates the level of technology development/maturity for each element of the model. It shows us that we are still some way from a complete, open and interoperable broadcast architecture, but that in some areas at least, workable technology is now available centred on live and post-production and AV reproduction in the home (and cinema).

Although there is some way to go, 2017 could well see audio objects at the heart of UHD TV broadcasting.

---

## Satellite interference comes down to earth

Satellites are used in television both for broadcasting itself, and for carrying vision and sound between studio centers or back to base. The satellite acts a relay which receives a signal from one up link transmitter, and retransmits it to another location or area. It needs to receive the correct signal to do its job.

Sometimes, an operator presses the wrong button at the up-link transmitter, and there can be un-intended interference to the satellite which prevents it from relaying the intended signal. Step up the system termed 'Carrier ID', which is a message included in up signals that gives details of how to contact the operator of the up-link. Thus, if the up-link operator is making the mistake, he or she can be telephoned and asked to remove their interfering signal. This works reasonably well.

But there are increasingly occasions when there is intentional interference designed to prevent a satellite operator from relaying the intended signal to its new destination(s). This happens in



several parts of the world, and broadcasters are increasingly concerned about it. Those that cause the deliberate interference are usually not anxious to reveal who they are and where they are.

Among others, a number of international broadcasters experience this problem. Satellites themselves can be used to identify the location of the interfering signals by a process similar to triangulation, but this is expensive and time consuming.

At the recent meeting of a sub group of the World Broadcasting Union, WBU-ISOG, a working group was set up to help

solve the problem of intentional interference. The group will create guidelines for what steps a broadcaster could take when interference occurs, define what exactly 'harmful interference' means in technical and operational terms, and encourage the ITU to survey the situation and collect information about what is happening. The group will be led by Nigel Fry BBC.

At its recently concluded ITU Plenipotentiary Conference in Busan, Korea, member states agreed to support ITU efforts to track reported cases of interference with satellite broadcasts.



# Audio contribution over ISDN is (almost) dead, long live audio contribution over IP!

MATHIAS COINCHON, EBU, TELLS US WHY LIVE AUDIO CONTRIBUTION OVER IP WILL OUTLAST ISDN

In early 2006, Swedish Radio triggered an alarm at what was then called the EBU Network Management Committee (NMC): "ISDN is being phased out by our telecom operators. We must quickly find a replacement solution for our audio contribution!" At the time, most radio stations in Europe (and the world) relied on Integrated Service Data Network (ISDN) for their news contribution, live concerts outside the studio, and international exchanges. It provided affordable, on-demand, connections with guaranteed fixed bitrate with low latency in order to stream compressed digital audio. Many still rely on it, but this is changing as telecoms operators are either phasing out ISDN or making it a niche expensive product.

Back in 2006, the Network Management Committee decided to create a group for Audio Contribution over IP (N/ACIP) with Lars Jonsson, Swedish Radio, as chair to address the problem and come with a solution. From the start, IP was seen as the only way to go. Some early products using IP were already on the market, but no standards existed. The group worked on designing a standard based on existing protocols to facilitate integration into existing infrastructures. Session Initiation Protocol (SIP) telephony was already growing and so it was decided to base the standard on it for signalling and Realtime Transfer Protocol (RTP) for transport.

The ACIP group brought manufacturers together to agree on a common proposal and the first version of the standard was launched in 2007, Tech 3326: Audio over IP, requirements for interoperability. This standard proposed a set of audio encoding from low bitrate compressed audio to linear Pulse Coded Modulation (PCM) audio, offering more flexibility to broadcasters than with ISDN. As the majority of manufacturers had implemented the standard alongside their proprietary solutions, two plugfest workshops were organised to improve interoperability and clarify the standard.

Since then, the ACIP group has become the meeting point for experts from broadcasters and manufacturers,



with a growing number of participants. Recently, the North American Broadcasters Association (NABA) joined the initiative by showing support for the ACIP recommendations. Based on the success of ACIP, another group focusing on Intercom was created and proposed a lighter version of the Tech 3326 standard for audio over IP for Intercom applications (EBU Tech 3347).

Many broadcasters have now deployed audio contribution over IP in their organisations using SIP servers and sending the audio over dedicated (private) IP networks with managed quality of service, and even on the open Internet. Compared to ISDN, the Internet does not offer end-to-end guaranteed bitrate and delay. As a result, broadcasters live with the risk of dropout or connection loss that can be acceptable in some applications such as news.

Mitigation techniques exist to reduce the risks of dropouts. Redundant streams on multiple Internet accesses is one example. Recently, Beligan EBU member VRT worked with their operator Belgacom to use their SIP infrastructure for voice over IP on VDSL lines for transporting their audio contribution. Doing it this way meant that the audio benefited from the managed quality of

service associated with the voice over IP service. Although this was a national-specific solution, it could possibly work on the international level, provided that telecom operators interconnect their voice over IP networks.

In 2012, the group was renamed ACIP2 with new objectives. Operational experience with the ACIP standard suggested that broadcasters needs a means of better exchanging network and audio parameters. For example, the settings for buffering, audio compression will not be the same if the connection happens on a private managed broadband IP network for a music concert or on the Internet access of a hotel room for a journalist. After a year of effort from an ACIP taskforce, the new profile recommendation – Tech 3368: Audio over IP, Profiles – was published.

While ACIP has concentrated on wide area networks, the Audio Engineering Society (AES) has produced a standard: AES67, for Audio over IP in studio environments with very low delay, PCM audio, and synchronisation. The combination of both proposals from AES and ACIP bring a unique solution for audio over IP for professional applications. What's next? Perhaps a new AES/EBU interface? Time will tell.



**DAVID WOOD**, EBU, LOOKS AT THE RESULTS OF THE RECENT WORLD BROADCASTING UNION'S SURVEY AND GIVES US FOOD FOR THOUGHT.

*“What should ‘we’ (broadcasters) be doing now, and how should we work together for best effect?”*

# The future of broadcasting – A hard look

The year 2020 looks like being remarkable. India plans to put a man on the moon. Volvo will have a ‘crash-proof’ car using a combination of radar and sonar (and I’ll be buying one). The Olympic Games will be held in Tokyo with coverage in 4320p UHDTV. But there will still be ITU study groups - and a World Broadcasting Union with the EBU as an important member.

The World Broadcasting Union recently conducted a survey of what challenges the Unions’ broadcaster members will face in 2020, and what they are (or should be) doing now to be ready for them.

The results of the questionnaire were diverse. But a pattern emerged from the totality of the replies. The replies fell into three groups.

The ‘2020 pre-occupation’ for a first group of countries/broadcasters, such as Japan and Korea, and to some extent China, is to introduce new media that are sophisticated, and offer a more immersive viewer/listener experience. Their main concern is the ‘race’ to the technology of UHDTV and Advanced Sound Systems. They have plans and timescales for doing so. They have the capacity to manufacture the TV displays needed for 2160p and 4320p.

The technology-pathfinder world beyond 2020 looks likely to be quite different to the past, when Europe and the US were leaders in new media technology with NTSC, ATSC, PAL, SECAM, MAC, and HD-MAC. Those days are gone. Tomorrow’s world will be 2160p, 4320p, and ASS from countries that not only have done the technology research but can supply the hardware as well.

This contrasts with a second group of broadcasters in the developing countries. For many, the 2020 challenge here is simply to survive as broadcasters. Many have still not made the transition from analogue SDTV to digital SDTV (let alone HDTV). The situation varies from country to country but, for some, we are in the world of one

old analogue television set per village. For some, the idea of a transition from analogue to digital TV to expand the services available is largely irrelevant – and there are still many unused analogue channels. Programme production has to be done with elderly equipment. The issue here is whether public service media can be funded at all.

Most of the countries/broadcasters from the developed world, including developed Europe and North and South America, lie in a third group. Their image and sound ‘delivery quality’ horizons are more modest than the first group above. Many have already made the analogue to digital transition, and some TV broadcasts are already HDTV. For this group there are two main different pre-occupations.

The first is fighting off the attempts to take away the spectrum used today for terrestrial television. Even in countries where satellite and cable are widely used, terrestrial broadcasting is seen as vital for many reasons. The second is to understand how they can cope with hybrid TV, and the ‘convergence’ of broadcasting and internet – what could it be, and what role they should have.

So, given these three categories of broadcasters, what should ‘we’ (broadcasters) be doing now, and how should we work together for best effect?

In many cases, although broadcasters are conscious of what 2020 may bring, they do not have a defined plan for what to do now in order to be successful in 2020. The reason is because preparing a roadmap, with the possible exception of the first group above, is difficult and complex. However, the first step to finding answers is always to identify the right questions. To some extent this has been done.

Why not try your own hand at an easy prediction? In 2014, there are estimated to be 15,000 broadcast TV channels in the world. Would you care to estimate what the number will be by 2020?





## Digital radio, the road to success

EBU PUBLISHES DIGITAL RADIO REPORT. DR. DAVID FERNÁNDEZ QUIJADA, EBU, GIVES US THE INSIDE SCOOP AND MAIN HIGHLIGHTS OF THE REPORT

**D**igital terrestrial radio is not new. It has been around for more than two decades. The original Digital Audio Broadcasting (DAB) system was developed in the late 1980s and early 1990s. In 1995, NRK in Norway became the first broadcaster to launch a DAB service, NRK Klassisk. Currently, you can receive DAB services in 19 European countries and several others in different areas, mainly in the Asia-Pacific region. We must admit, however, that digital radio has had a limited success in the world market.

To build the case for digital radio, the EBU's Media Intelligence Service and Radio Unit conducted a project aiming at identifying the key success factors for radio digitisation. Called the 'Digital Radio Toolkit', the research was carried out through interviews with different radio industry's stakeholders and has recently been published on the EBU

website (<http://www3.ebu.ch/supporting-psm/advocacy-policy-development/digital-radio>).

Last year, the EBU issued a Recommendation on Digital Radio Distribution in Europe (EBU R 138). The document suggests the immediate deployment of primarily DAB+ services and, only if DAB coverage is not possible, the use of DRM as a broadcasting alternative. As a next step, the Digital Radio Toolkit offers guidelines on how to handle the launch of digital terrestrial radio, building on the experience and good practice in the three countries leading this process in Europe: Norway, Switzerland and the United Kingdom. This way, new markets can benefit from the experience of the early adopters.

### **A resilient and vibrant medium**

Close to its 100th anniversary, radio has demonstrated its capacity to adapt to the

changing tastes, behaviours and habits of society. In the 15 biggest European radio markets, it reached nearly 370 million individuals weekly in 2013 – 83.4% of the measured population – for an average listening time of three hours per day. Although listening time has slightly declined in the last decade, radio reach has remained stable. This means that despite the increasing competition from a vast array of new players, radio is a healthy medium.

The EBU sees terrestrial radio as the only radio distributed on a universal basis and free at the point of use. At the same time, it is also the only platform that guarantees the delivery of public service content and its associated values. In its analogue form, there is no room for development in most of the European countries. The future won't just be the broadcast of radio, but broadcasting as the backbone of a hybrid radio future.

Switchover to digital transmission is an essential element to this future.

### Technical challenges

Since its first release, there have been several updates to the DAB standard. These include: the shift towards DAB+ and the possibility to include video through DMB and DAB-IP. Although DAB is a mature standard, the evolution of technology and the market needs pose new challenges for the technical aspects; challenges which the basic core technology have been able to meet.

Two of these challenges are the need to find an affordable solution for the digitisation of local radio stations and the growing hybridization. The former is being tackled through low-cost software-based solutions that avoid the need for extra investment such as redundancy systems, as is currently being trialled in Switzerland through the so-called DAB+ islands. Hybridization is being addressed through the development of an increasing number of hybrid services like the prototype of hybrid radio adaptor for in-car use unveiled by UK Radioplayer last September. EBU technical working groups have pioneered both these technologies and remain close to their ongoing development.

### Implementation challenges

Beyond those and other technical issues, the biggest challenges are now in the implementation phase: how to market digital radio successfully?

The 'Digital Radio Toolkit' identifies 30 different key success factors, each with a specific national example. These cover eight areas: institutional structure, policy and regulation, content and offer, technology, switchover process, public communications, consumer electronics and the car industry.

In summary, there are 'five Cs' that digital radio needs to achieve success:

• **COVERAGE:** At the end of the launch process, digital radio coverage must be at least the same as analogue radio. Including major roads in the coverage plan will involve the car industry and commuters, and is made possible by stable in-car digital radio signals. Listeners will simply not tolerate losses in coverage. Importantly, mapping and clearly communicating the coverage evolution over time avoids frustrating early adopters.

• **CONTENT:** The content proposition needs to be strong, with clear added-value for digital services over the analogue portfolio. New radio channels and

programmes are a must. There are good examples of strategies in the various DAB countries to drive listenership to digital platforms: moving successful analogue services or programmes to digital-only stations for example. Adding visuals, multimedia, metadata, higher sound quality or interactive features also help even if they are not seen as a priority for the broadcasters or for the listeners currently.

• **COSTS:** Bringing in new technology can be costly: distribution costs and production costs for new content. But digital transmission is cheaper than analogue, fully realized only with analogue switch-off. To minimize the costs new content production, you must maximise the economies of scale. This can be achieved by producing the same output for a larger distribution, for example by importing content from other platforms. You can also share the costs of production among a larger number of stations, for example by airing the same radio show with customized music for different stations. Broadcasters need to be sensitive to the fact that returns on investment are not immediate. If managed successfully, the long-term benefit will outweigh the initial costs.

• **COLLABORATION:** The basic motto is "Compete on content but cooperate in technology". If this is the shared vision between public and private broadcasters, then success comes easier and quicker. This doesn't include broadcasting but IP-delivery platforms as well. A clear example is a common Internet player or apps across a national offering. Led by broadcasters, all the stakeholders must work together: network operators, regulators, governments, industry bodies, manufacturers, distributors, device retailers and the car industry. The aim

should be to identify incentives for each sector– better services for audiences, expand the service portfolio, generate new revenue streams, sell new devices, etc. Creating win-win situations and reducing uncertainties attached to any technological transition.

• **COMMUNICATION:** Public communication is an essential part of any new technology introduction: making the citizens aware of the new platform and its associated services. It is also a central tool to involve the other stakeholder industries. The message must be consistent and aimed at avoiding confusion in the market. For this reason, several countries have set up a joint industry body to deal with public communications and marketing. The messages focus on the added value of digital radio; this basically means the new exclusive stations and, only secondarily, audio quality. Finally, it is important to keep it simple: promote 'digital radio' and not 'DAB' or 'DAB+', since it is easier to understand. Remember that the "digital" has positive connotations for most people.

The 'five Cs' formula does imply a sixth one: commitment from all the stakeholders. This commitment clearly shows the goals and ambitions of the industry and sends the strongest possible signal to listeners. For them, digital radio represents an expanded offer of services, not just limited to traditional programming but as a driver of other audio innovations in broadcasting and IP platforms.

As a final thought, it is important to remember that listeners are attached to programmes, stations and presenters, not to technology. But digital technology can help broadcasters better address the needs of these listeners. The challenge is to find the balance between these needs and the viability of the market.



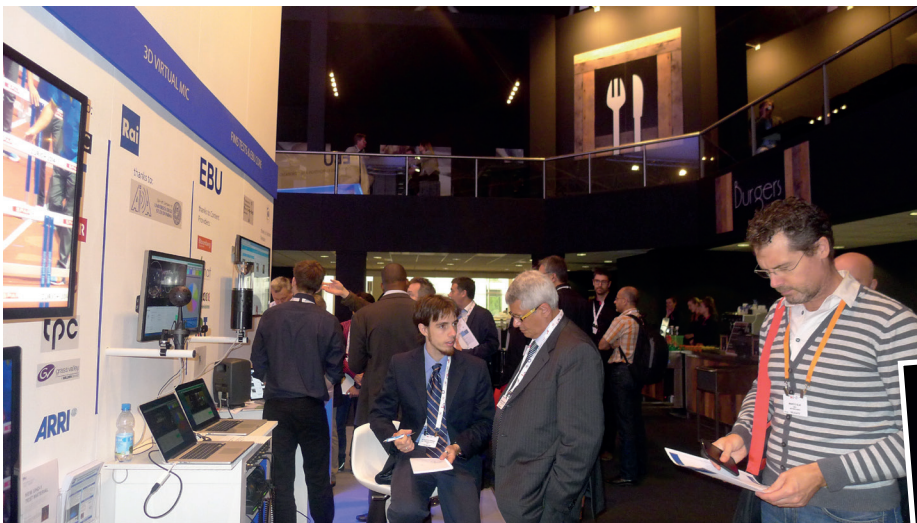


# EBU @ IBC 2014

IBC IS EUROPE'S LARGEST ANNUAL EXHIBITION AND CONFERENCE DEDICATED TO BROADCAST TECHNOLOGY. THE EBU WAS PRESENT ONCE AGAIN WITH DEMONSTRATIONS, PRESENTATIONS, CONFERENCE SESSIONS AND MEETINGS AT THE STAND TO ENSURE PUBLIC SERVICE MEDIA REMAINS AN IMPORTANT PART OF THE BROADCASTING AGENDA AND THAT EBU REMAINS AT THE FOREFRONT OF TECHNOLOGY AND INNOVATION.

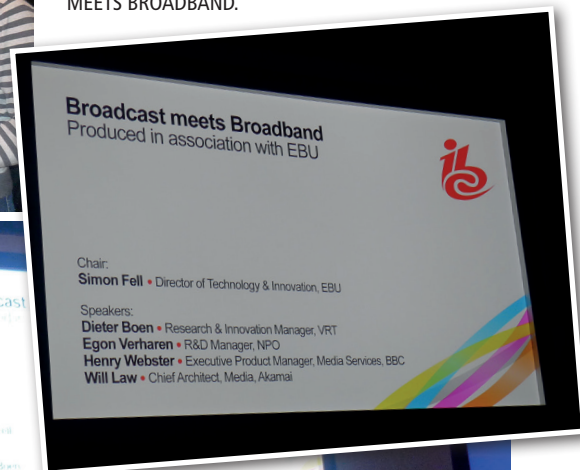


▲ A NUMBER OF DEMONSTRATIONS WERE SHOWN BY EBU TECHNOLOGY & INNOVATION AND MEMBERS INCLUDING CROSS-PLATFORM AUTHENTICATION AND HEVC OVER DVB-DASH.



◀ RAI SHOWED OFF THEIR 3D VIRTUAL MICROPHONE TO A STEADY STREAM OF VISITORS. THE MICROPHONE IS CAPABLE OF CAPTURING ANY ACOUSTIC SIGNAL COMING FROM ANY DIRECTION IN SPACE WITHOUT THE USE OF ANY MOBILE DEVICE.

▼ SIMON FELL, DIRECTOR OF TECHNOLOGY & INNOVATION, CHAIRED THE EBU CONFERENCE SESSION ON SATURDAY, WHEN BROADCAST MEETS BROADBAND.







▲ NEARLY 100 PARTICIPANTS STOPPED BY DURING THE EBU OPEN SOURCE MEET-UP WHICH PROVIDED A GREAT OPPORTUNITY TO HEAR LIGHTNING TALKS ON RELEVANT SUBJECTS AND NETWORK WITH OTHERS.



◀ BBC AND OTHERS TOOK ADVANTAGE OF OUR INNOVATION THEATRE, PRESENTING ON SUSTAINABILITY AND BROADCASTING.



As usual, the EBU had a strong presence at IBC. Our Director General, Ingrid Deltenre, led the way at the IBC Leader's Summit on Thursday. Simon Fell, Director of Technology & Innovation, also took part in the Great Spectrum Debate on that day.

In total, there were 18 articles featured in the IBC Daily relating to our demonstrations, stand, conference sessions and meetings. The attendance for IBC was up from previous years (54,036 people attended in total) which meant that the stand was buzzing with activity from early morning until the doors closed in the evening.

Twenty-five presentations took place in the Innovation Theatre on a range of topics such as networked media, FIMS, UHD IP and sustainability in broadcasting. Several of our Project Managers spoke at various conference sessions, including one on assistive technology and the EBU hosted its Loudness breakfast once again on Monday morning.

The EBU also had a much greater presence on social media this year, engaging with participants at IBC and those following online from home. See for yourself by searching #EBUIBC on Twitter.

▼ AT THE AWARDS CEREMONY, AMONG THE 14 PARTNER ORGANIZATIONS MENTIONED BY FIFA TV, WAS EUROVISION OPERATED BY EBU FOR THEIR HARD WORK AND INNOVATIVE SOLUTIONS HELPING TO DELIVER THE FIRST 4K/UHD-1 WORLDWIDE FEED FOR THE WORLD CUP. GOOD WORK TEAM!





# Personalized web experience on any device

WHAT IS CROSS-PLATFORM AUTHENTICATION? WHY IS IT IMPORTANT AND WHAT CAN IT DO FOR BROADCASTERS? **MICHAEL BARROCO**, EBU, INTRODUCES THE PLATFORM.

Audiences have always expected easy access to broadcasters' content: think channel numbers on a remote. Today, this gets more complicated when we try and replicate this easy-of-access whenever, wherever and however a consumer wants. They use devices as a window to a personalized media experience, no matter what the size, the resolution or the quality of the distribution.

Currently, in order to propose the most relevant content to people, broadcasters use a mix of different strategies such as editorial selection and global viewing statistics to get the most popular content. The arrival of Netflix in Europe and their popular data-driven culture highlights new ways of publishing media content. This breaks the traditional broadcasting model moving it from a one-to-many relationship closer to a one-to-one relationship.

The fundamental feature behind building such relationships is the ability to identify the user of a device. Enter Cross-Platform Authentication (CPA) – let's explain.

The challenge for broadcasters is to unify the user experience between online (tablet, smartphone, computers) and media devices (TV, Radio). It's easy for Netflix or Spotify: they control the whole distribution chain and create apps for each device. Broadcasters, on the other hand, have to rely on standards like HbbTV in order to launch their apps on TVs. The long-term advantage is that broadcasters shouldn't need to build an app for every TV manufacturer.

It's more complicated for radio devices as device manufacturers require reliable and stable standards in order to implement new technologies because they cannot update chipsets as fast as tablets or phones. And there's no HbbTV for radios.

But relax, we have found a solution! An international collaboration involving public, private broadcasters and manufacturers organised by the EBU Technology & Innovation team have developed Cross-Platform Authentication (CPA) Protocol that specifies how to securely associate an online identity with an IP Connected device.

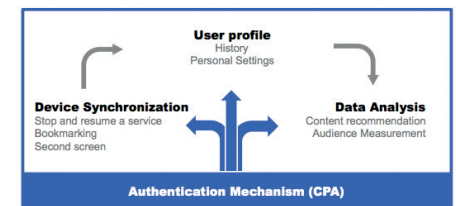


The first version of the protocol, which addresses limited input devices (like a radio), was published in early September as an EBU recommendation: Tech 3366. Leveraging the link between devices and users. The user is able to launch an application from the TV on his companion screen and share the live broadcast content with a friend who can then play this content on-demand directly on his TV or his phone.

In terms of deployment, the BBC adopted the CPA protocol to allow radios to bookmark content on the BBC Playlist. It is currently in production. RadioTAG will reference this authentication mechanism in its specification. RTVE (Spain) and RTS (Switzerland) are in the process of adopting it. On the device side, Frontier Silicon has implemented it in their chipsets. An HbbTV prototype has been implemented by simply using the open source cpa.js library and was demonstrated by EBU Technology & Innovation at IBC 2014.

Next up, the EBU CPA Group will focus on enabling single sign-on between TV channels on HbbTV. Since the Group

## AUTHENTICATION IS THE BASIS FOR CLOUD-BASED FEATURES



would like to get the same behaviour on a TV as on a Radio, they need to add little specificity in order to support the fact that HbbTV portals are running in web browsers and handle the built-in security features, which is not the case for radio devices. Moreover, the group would like to specify or recommend a solution to authenticate a user on a native mobile application in order to get a full set of flows. The objective is to bring the CPA specification to ETSI standardization by the end of 2015.

The pictures show a radio receiver prompting for association using the flow described on the next page picture and a TV associated with a user identity and notifying that somebody shared some content with the logged in user. More information: <https://tech.ebu.ch/cpa>

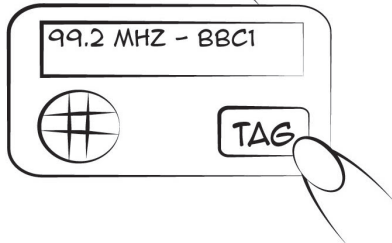
# THE CROSS-PLATFORM AUTHENTICATION PROTOCOL

## RADIO

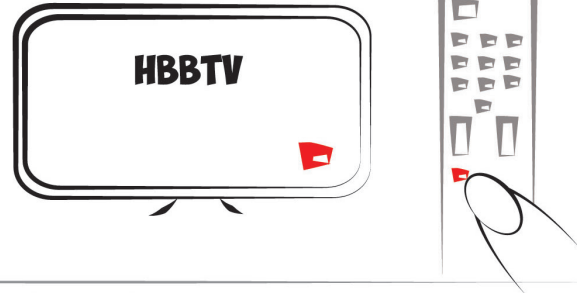
## TV

1

PETER IS LISTENING TO BBC RADIO 1 AND WANTS TO BOOKMARK THE CURRENT SHOW USING THE TAG BUTTON

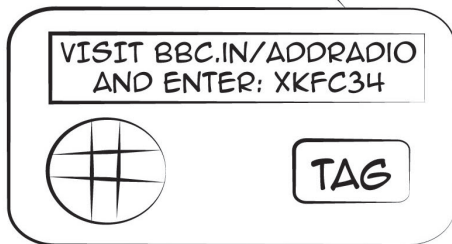


CHRIS IS WATCHING RTS 1 AND WOULD LIKE TO SHARE THE CURRENT SHOW WITH A FRIEND BY PRESSING ON THE RED BUTTON



2

THE DEVICES PROMPT A CODE AND A WEBSITE



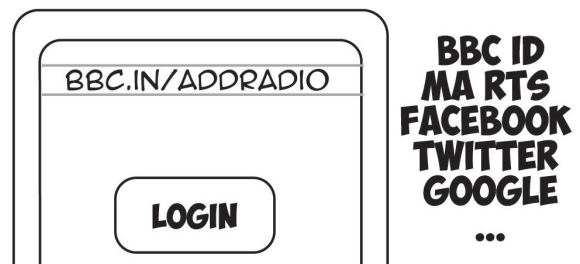
3



PETER AND CHRIS TAKE THEIR TABLET OR PHONE AND OPEN THE WEBSITE IN ORDER TO START THE PAIRING BY ENTERING THE CODE

4

THEN, THEY CAN AUTHENTICATE THEMSELVES USING THEIR FAVORITE IDENTITY PROVIDER AND FINALIZE THE PAIRING



5



CHRIS CAN NOW SELECT A FRIEND AND SHARE CONTENT WITH HIM AS WELL AS SYNCHRONIZE HIS TV WITH OTHER DEVICES, AND GET PERSONALIZED CONTENT AND RECOMMENDATIONS

MB, EBU 2014



# Radio e Televisão de Portugal (RTP)

**CARLOS GOMEZ, RTP, GIVES US AN OVERVIEW OF RADIO E TELEVISÃO DE PORTUGAL AND ITS SERVICES.**

The current Radio e Televisão de Portugal (RTP) has its origin in two companies: RDP (Portuguese Radio, which began operations in 1936) and RTP (Portuguese television that began operations in 1957). In 2004, these two companies came together to form what we now know as the Radio e Televisão de Portugal.

In Portugal, RTP is responsible for the provision of public service radio and television. The following shows the current distribution channels for TV and radio.

## STUDIOS

In the major Portuguese cities, there are regional offices, and in the Azores Islands and Madeira there are local radio and television transmission facilities. The main production centre is located at the company headquarters in Lisbon, with three conventional studios (one virtual set studio, and two dedicated solely to news).

The main production centre for radio is



also located at the company headquarters in Lisbon, where there are 21 production and broadcasting studios and four post-production.

## PRODUCTION AND BROADCASTING RESOURCES

RTP currently relies on 1800 permanent staff members and some collaborators. Since 2010, there has been a policy to downsize the amount of staff.

From 1998 until 2011, RTP ran DAB services. However, a lack of interest from listeners and other operators led to this technology being stopped. RTP handles its own FM and AM distribution networks, but the DTT network belongs to another company, who won the public tender for DTT operations.

The production of radio channels is completely based on client/server systems since 1996. The first was the Numisis, followed by Mar4win and currently Dalet. Since 2006, the operation of television is "tapeless" based. This year, RTP launched its Digital Content Management project (DCM) to move toward a "tapeless" operation. The system focuses on storage units Petasite/SUN/Quantun, where contents produced

Television channels	
RTP 1	General channel, available in DTT, and by all cable operators.
RTP 2	Channel dedicated to cultural issues, available in DTT, and by all cable operators.
RTP Memory	Channel with archive-based content, available by all cable operators.
RTP Informação	News channel, available on all cable operators.
RTP África	Channel dedicated to topics of interest to Africa, present by all cable operators and terrestrial network in the following countries: Guinea-Bissau, Cape Verde, São Tomé, and Mozambique.
RTP Internacional	Channel dedicated to topics of interest to Portuguese communities around the world, diffused by many cable operators and also by satellites: HotBird, Intelsat907, AsiaSat, Intelsat 805, Galaxy 19 and Estrela do Sul.
Radio channels	
Antenna 1	General channel, broadcast nationwide by FM and AM networks. Also on some satellite.
Antenna 2	Channel dedicated to cultural themes, spread across the country by the FM network.
Antenna 3	Channel dedicated to youth issues, spread across the country by the FM network
RDP África	Channel dedicated to topics of interest to Africa, in FM in Portugal but also terrestrial networks in the following countries: Guinea, Bissau, Cape Verde, São Tomé, and Mozambique.
RDP Internacional	Channel dedicated to topics of interest for Portuguese communities around the world, distributed by satellite HotBird, Intelsat907, AsiaSat, Intelsat 805, Galaxy 19 and Estrela do Sul.

in all areas are stored (Ingest, Production, Regional and News) and subsequently sent to the broadcasting servers when needed, according to planning.

Most channels at RTP are currently in SD/16:9, but there is a full HD (RTP 1) service distributed exclusively on cable. The recent financial crisis has slowed down the modernization of RTP, with the main resources coming from a contribution of 2.65 €/household/month, advertising (6 minutes/hour), and other resources (marketing sales and so forth...).

#### COOPERATION

The RTP has looked meticulously at partnerships with their counterparts from African Portuguese-speaking countries. Cooperation with public television and radio companies of Guinea-Bissau, Cape Verde, Sao Tome and Principe, Angola, Mozambique and Timor, is one of our most important missions.

#### ON THE WEB

Internet presence is critical for RTP. With some of our content available for VOD, and all channels available in real time streaming with RTP Play (<http://www.rtp.pt/play/>), we also have pioneered the development of an application 'second screen - 5i' that allows our viewers to monitor and interact with our live shows in Portugal.

Simultaneously two portals were developed:

1. 'Ensina': (<http://ensina.rtp.pt/>) allows the students to browse our archive looking for contents related to the subjects studied.
2. 'Arquivo'. (<http://www.rtp.pt/arquivo/>) Allows the citizens to access all the richness of the sound and video files at RTP archive.



## Galina Federova, RTR

IN EACH ISSUE OF TECH-I WE ASK A MEMBER OF THE EBU TECHNICAL COMMITTEE TO STEP INTO THE SPOTLIGHT. THIS TIME IT'S RTR'S **GALINA FEDEROVA'S** TURN.

efficient and transparent. I seek to use my role as a member of the Committee to share experience, knowledge, ideas and the needs of Russian broadcasters. My hope is that all this will ultimately serve to create more technologically advanced, internally competitive and externally open broadcasting markets in Russia that will offer security, transparency and opportunity for its foreign partners and investors.

#### WHAT, FOR YOU, ARE THE MOST IMPORTANT CHALLENGES FACING EBU MEMBERS TODAY?

I believe the biggest challenge is to work out the strategy of technical development that enables public broadcasters to retain and increase their relevance in the new market reality of significantly changing patterns of content consumption. In this context, the main game changing developments will be the implementation of interactive personalized services and the adoption of new broadcasting technologies that will raise the quality of TV viewing on a new level.

#### TELL US ABOUT SOME OF YOUR INTERESTS AWAY FROM THE WORKPLACE.

I love traveling. I've taken canoe trips on many Russian mountain rivers. I enjoy table tennis and badminton. But most of all I am passionate about theatre and literature. Russia has a flourishing theatre scene, with many domestic performances and visits of prominent foreign opera, ballet and theatre companies. I attend the best theatrical performances in Moscow and Saint Petersburg. I read a lot.

#### WHAT ARE YOUR CURRENT RESPONSIBILITIES AT RTR?

In my current role as a Deputy Director of the Distribution Network Department of RTR, Russia's largest state-owned television company, I am responsible for the strategy of the national TV and radio network development. My role includes the implementation of new network design and new technologies of broadcasting that are based on the White Paper on the Development of Television and Radio Broadcasting in 2008 to 2015 adopted by the Government of Russia. Recently, I have also been working on the implementation of new technologies of interactive TV based on OTT and HbbTV.

#### WHAT DO YOU CONSIDER AS YOUR FINEST ACHIEVEMENT SO FAR IN YOUR CAREER?

I contributed to the launch of digital terrestrial broadcasting in Russia, the development of network architecture and advanced technologies of network infrastructure. For the time being my primary area of work is the migration from traditional broadcasting to innovative interactive services based on OTT and HbbTV technologies.

#### WHY DID YOU STEP FORWARD AS A CANDIDATE FOR THE EBU TC?

Participating in the Technical Committee's work enables me to shape the position of RTR on new technologies more effectively. I seek to facilitate the implementation of EBU recommendations in Russia. My goal is to make interactions between Russian and foreign broadcasters, telecom providers and equipment vendors more



# PRODUCTION TECHNOLOGY SEMINAR 2015

PRODUCING SMARTER  
27-29 JAN • EBU, GENEVA



11 FEBRUARY 2015

# Digital Radio Summit