MEDIA TECHNOLOGY & INNOVATION

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tech-i

Hybrid is here to stay

Plus

- **HBBTV APPLICATION DISCOVERY OVER BROADBAND**
- **EVERYTHING YOU NEED TO KNOW ABOUT NETFLIX**
- **WHAT'S IN THE SANDBOX?**

and more...

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Is that the Global Village I see before me?

Simon Fell, Director, EBU Technology & Innovation

Are we now living in the "Global Village" postulated by Marshall McLuhan in his book 'Understanding Media' in the 1960s? He described how *"the globe has been contracted into a village by electric technology and the instantaneous movement of information from every quarter to every point at the same time. In bringing all social and political functions together in a sudden implosion, electric speed heightened human awareness of responsibility to an intense degree."*

I write this as we approach election season in my home country, the UK, and I am reminded how 'Virtual Sets' and news technology – now extending to Augmented Reality and the extensive use of social media – are constantly innovating as each election approaches. As well as the arsenal of technologies deployed by broadcasters in the studio, we now have micro social media apps such as Periscope and Meerkat capturing the zeitgeist of popular opinion and turning the world into news reporters or commentators.

What does this mean for the coverage of news and events in the future? Is it all over? Should we hand the keys to the news studio over to the public and leave them to it?

A few minutes of experimentation with both apps taught me that as social media sites such as Twitter integrate your followers with extensions such as Periscope, this leads to new trends that test our understanding of what live reporting can be.

When I picked up that these apps were becoming popular recently, I thought back to 2008 when one of the young technologists in my Future Technology team went to a demonstration in London and began streaming live over what was then 3G or still 2G. There was not much frame rate as I recall – but, he quickly had about ten followers live and it was quite an exciting moment, showing the promise of the future. We were using Qik in those days which I understand was closed down by Skype when they purchased it in 2014. It is now Skype Qik focused on short video messages between users. You might ask whether the old Qik should have continued given the recent explosion in popularity of the new apps.

What we are seeing is improved bandwidths leading to an acceptable service and creating a new paradigm (to use a current buzzword) – hence public adoption. It may be just a fad, but a few minutes spent with both new apps today elicited the following gems. Live from the Queen Mary Hospital in London where a new princess was born we had professional users such as Sky News and approximately 225 live viewers all the way to a new Periscope user who was trying out his new skills as a street reporter in the same location. The social media aspect showed users encouraging him to carry on and giving tips with a stream of hearts floating by. I'm not sure that the live tweets superimposed over the video add value in all cases but it certainly changes ones perspective. This was quickly followed by a visit courtesy of Meerkat to the Brewood versus Bridgnorth cricket match in the rain where one helpful viewer (from 10 live viewers) suggested tea and crumpets?

Then over to a live concert in Johannesburg, a rooftop bar in Istanbul, blossom on the trees in Central Park, New York, and some guys presenting from a bar in Taipei. Yes, some streams drop out, but many were surprisingly good.

In the year of the digital elections are we seeing the emergence of the Global Village before our very eyes? Food for thought, and be careful with that record button – you never know who may be watching!

What's the buzz?

EBU @ IBC

10-14 September, RAI Amsterdam

IBC is Europe's largest annual conference and exhibition dedicated to broadcast media technology. As usual, the EBU will be present with demonstrations, presentations and sessions at the stand to ensure that public service media remains at the forefront of technology and innovation.

https://tech.ebu.ch/events/ibc2015

DEVCON 2015

06-07 October, EBU, Geneva

In today's media world, it's all about being agile. Join us at our 3rd EBU Developers Conference and get hands on with current software development and deployment tools, share best practice and learn from the pros.

https://tech.ebu.ch/events/devcon15

FORECAST

20-21 October, EBU, Geneva

Our annual seminar dealing with broadcast technologies, spectrum management and related topics attracts more than 100 broadcasters, policymakers, and other industry stakeholders each year.

https://tech.ebu.ch/events/forecast15

The way people consume media has completely changed. I asked our audience this month, how can we create a new foundation for our stories? Here are some of their replies… @skframe

"The way things are changing greatly depends on cultural factors, the nature of the content and the development of what's on offer in other areas" – GEORGES BERY

"No one knows what the media habits of the digital generation will be in later life - I doubt it will be playing candy crush. If it is, the world is in trouble. I suspect it will be watching television broadcasts - silently saying as we do today: 'go on - surprise me'." – DAVID WOOD

"The only way Public Service Media can protect our vision of society is by creating free digital services that are respectful of the privacy and habits of their citizens and ensuring actual marketing neutrality." – BRUNO TÉZENAS DU MONTCEL

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Unifying the radio experience

This year's Digital Radio Summit marked the 8th anniversary of such an event. With over a 110 participants from 25 different countries as far as Australia and the United States, the event showed that discussions around the future of digital radio are still at the top of the agenda in many organizations.

EBU Director of Technology & Innovation, Simon Fell, opened the event with remarks on the many exciting developments showing the promise of digital radio in today's crowded consumer electronics marketplace. He pointed to the example of visual radio coming into its own, with the EBU currently supplying visual radio to at least 20 radio stations and websites for the 2015 FIS Alpine World Ski Championships in Colorado. "We need to ensure that radio has a bright future by continuing to develop and push the boundaries of what is possible," he said.

Michael Hill, Founder and Managing Director of UK Radioplayer Ltd, set the scene by focusing on how broadcast and internet radio will offer an attractive listener experience in the future. In particular, he urged participants to take on three tasks to bring hybrid radio to the next level: "Launch your own shared player platform; help solve the data-jigsaw and commit to RadioDNS, if you haven't already; and, help fight back against the companies that want to steal our place on the dashboard."

Digital radio is not so much about platforms anymore but rather about offering a simple and attractive listening experience to audiences. Often, the digital radio experience in cars is too complicated compared to newer applications and services. For digital radio to work and maintain its attractiveness, it must be seamless and automatically select the best way to receive services (i.e. service following).

Frank Nowack, Ford's Function Owner for Broadcast Media and Reception, noted that the car industry (Ford) is dedicated to going forward with digital radio, but that more coverage of European roads must be achieved to do so. There is no doubt that connected cars are coming but, streamed radio in cars won't replace broadcast radio.

Other key topics of the day included digital migration, smart and hybrid radio, and radio in smartphones. The development of interactivity and personalisation in radio also seems inevitable. To achieve this, BBC has worked within the EBU framework to help create a Cross Platform Authentication Protocol which allows user devices to pair with apps and avoids one having complicated logins foron every device and for every station. This is just the start. For more information, see: https://tech.ebu.ch/events/drs2015

Out of chaos comes brilliance

The phrase above was only one of the many mantras of this year's EBU RadioHack. Other principles to follow included "RadioHack has no schedule," "RadioHack is not a competition," "You're allowed to have fun," and "Let's get hacking!"

This year marked the 4th anniversary of the EBU RadioHack event, a set of freeform workshops where developers, engineers and geeks can experiment with the newest tools and techniques in digital and hybrid radio. The workshops are designed to have an informal, relaxed atmosphere, allowing participants to develop new ideas for tools and services and to start building them immediately.

The event began with a round of lightning pitches where Radio Hackers had the chance to share their projects and what they would tackle during the event. Key topics for this year included: a new EPG/SPI for RadioDNS and DAB; RadioWeb, DABberry receiver; the Universal Smartphone Radio Project API; hybrid and content radio; cross-platform authentication and tagging; visual radio production and more!

Other projects presented included work on service following, DAB transmission with ARM devices, automated chaptering of radio programming, ODR-mmbtools and a software defined digital radio receiver. For the rest of the afternoon – and well into the evening – RadioHackers shared experiences, collaborated and, well, just hacked.

For the first time, EBU RadioHack partnered with ITU who hosted this year's event. Participants had the opportunity to join their World Radio Day activities after the RadioHack. It was a great chance to make contacts and find new avenues to explore. For more information, see: https://tech.ebu.ch/events/radiohack2015

HbbTV – the only game in town

This year's BroadThinking event reached record participation. EBU Director of Technology & Innovation, Simon Fell, kicked off the event by saying he was "Proud that the EBU is involved in the development of HbbTV." He congratulated the hard work that has been done so far, pointing out that "There is still a way to go. Let's make sure that applications are easily accessible for all viewers."

Peter Mac Avock, Senior Manager at EBU, followed suit with his keynote speech about the current status of HbbTV in the market: "HbbTV is the only open game in town, so let's have fun playing it", he said triggering a roar of support from the audience.

Version 2.0 of the popular HbbTV standard was released only weeks before the event and was the highlight. Jon Piesing, TPVision, discussed the new technologies associated with it, including HTML5, CSS3 and DOM 3. Version 2.0 has many improvements in features such as MPEG-DASH. It is now suitable for live TV as well as on demand services and it is possible to insert advertisements and deliver non-real time content via broadcast.

Other key topics included: broadcasting signalling, HbbTV certification, access services, user interfaces, interaction and showcasing applications as well as MPEG-DASH, migration paths for interactive TV, and promotion tactics. For more information, see: https://tech.ebu.ch/events/broadthinking2015

NAB

Shouldn't the technology we see at broadcast trade shows have a direct relationship to the domestic viewing experience? Well, yes – however, implementing such new features is rarely as simple as seen at the trade show. Immersive audio is one example.

Qualcomm/Fraunhofer/Technicolor formed the MPEG-H Audio Alliance in order to promote the MPEG-H standard. NAB saw them showing off their Higher Order Ambisonics (HOA) system, with an appropriate mezzanine encoding solution to aid audio contribution compatibility.

MPEG-H includes formats also in the Dolby and DTS immersive audio systems in the object/scene-based audio space. The aims of these systems include aiding post-production, and enhancing audio interoperability, while making the audio experience in the home more immersive. But, if you listened to the audio experts at the SMPTE Technology Summit on Cinema (Las Vegas, 12/04/15), they complained that the multiplicity of object/scene-based audio systems adds other targets to their already complex job of rendering movie audio for different cinema scenarios.

If you consider that these engineers must also render sound for different devices in the consumer space, the simplicity that audio production engineers were promised with immersive audio isn't there yet. Looking into the home, the Swiss example suggests that only 9% of households have surround sound audio systems (and it's not clear how many of these are actually connected in 5.1 mode). New metadata-driven audio systems promise to make rendering audio for the home a more reliable process, with more intelligent home audio systems adapting audio output to suit speaker configurations. All agree that immersive audio is a key contributor to the quality of experience of television systems, but it's proving impossible for the industry to agree a single reference rendering system, and in the meantime, the audio engineer's work get harder, not easier. Bringing these systems into the home to improve the home cinema experience looks as far away as ever.

Broadcasters to regulators: treat UHF with extreme caution

The ITU-R Conference Preparatory Meeting (CPM) took place in Geneva from 23 March to 02 April 2015. The main goal was to produce a Report that will be the basis for upcoming discussions at the much anticipated World Radiocommunications Conference (WRC-15) in November 2015.

It was clear from the discussions that the additional spectrum allocations to the mobile service for IMT use will be one of the major topics to be addressed at the WRC-15.

For broadcasters, a major concern is the future of the UHF band. The UHF band (470-694 MHz) is essential for the provision of free-to-air TV services and it is the only spectrum for terrestrial television that remains globally harmonised.

As decided at WRC-12, the 694-790 MHz band will be allocated at WRC-15 on a co-primary basis with the mobile service for IMT use in Region 1 (which includes Europe, Africa and the Middle East). In Europe, this band will need to be released from broadcasting alone as the 790-862 MHz band was released previously, but the time schedule for this release is not yet decided and the process is complex. In addition, the protection of digital terrestrial television (DTT) below 694 MHz from interference from cellular networks needs to be ensured by adequate regulatory measures.

"In order to free-up the 700 MHz band, broadcasters and broadcast network operators will have to make substantial investments. These investments will only be made if there is certainty that the spectrum below 694 MHz will remain available for DTT for the foreseeable future. This would also enable the broadcast industry to innovate with new technologies and services (e.g. the generalisation of HDTV and the introduction of UHDTV)," Simon Fell, EBU Director of Technology & Innovation, pointed out.

In addition, this band is shared with Programme Making and Special Event (PMSE) services for wireless microphones. Both the DTT and PMSE services would be negatively affected by a sharing allocation of the band below 694 MHz with the mobile service.

EBU Members should urge regulators to consider the future use of the UHF band with extreme caution to preserve the UHF spectrum for DTT and PMSE at WRC-15, and to ensure their protection from interference.

RTVE starts UHD-1 trials over different platforms

UHDTV WILL BECOME A TANGIBLE REALITY IN THE NEAR FUTURE. **JAVIER SANCHEZ**, RTVE, TELLS US MORE ABOUT THEIR PIONEER TESTING AND THE CREATION OF A CHAIR IN THE SCHOOL OF TELECOMMUNICATION ENGINEERING OF MADRID.

As a public broadcaster, RTVE has always paid attention to providing the best possible quality to citizens based on standard devices in the market. Regarding UHDTV, our first 4k experience took place in 2013 and the first production was a video clip about the city of Barcelona, exhibited at the Mobile World Congress in February of that year.

The production about Barcelona was a pioneer experience shared by several companies, including the EBU, but perhaps its relevance came from the fact that it was the first 4k DVB-T2 transmission in Europe. These first tests were based on AVC/H.264 video encoding at 25p frame rate and, although there were no 4k TV sets available on the Spanish market capable of receiving such transmissions, they allowed us to gain real experience and lay the foundations for further initiatives.

The next 4k production was a documentary about the Prado Museum, entitled "The Passion of the Prado", which was presented at the Cannes Film Festival in April 2014. RTVE and the Telecommunication Engineering School of the Universidad Politécnica de Madrid (ETSIT – UPM), in collaboration with other relevant Spanish partners, broadcast this documentary using DVB-T2 transmissions.

Different encoding specifications and sets of transmission parameters were used during this initiative. Meanwhile, manufacturers started integrating the option to decode HEVC/H.265 video in their new flat screens. As soon as this feature was available, it was used in the trial. The higher efficiency of HEVC/H.265 allowed us to use a higher frame rate (50p instead of 25p) and to achieve smoother movement. In all cases, the transmission was based on DVB-T2 to ensure a higher spectral efficiency. Since DVB-T2 allows useful bitrates of around 50 Mbps, the bitrate of the deployed signal (up to 35 Mbps) was low enough to broadcast more programmes per multiplex. The district of Ciudad Universitaria in the northwest of Madrid was covered from a transmitter located at the Telecommunication Engineering School.

These experiences were presented in a workshop held at the RTVE Institute on 24 June last year (see tech-*i* magazine, Issue 21 for more information).

In order to strengthen its role in innovation and to carry out further trials, RTVE and the Telecommunication Engineering School of the Universidad Politécnica de Madrid signed a cooperation agreement for the development of telecommunication linked to the distribution of audio-visual content. This agreement provides for the creation of a RTVE Chair in that school and thus starts a strategic partnership between the two organizations to carry out training, research, study and outreach.

"This agreement starts a strategic partnership between the two organisations to carry out training, research, study and outreach."

The trials will be consistent with the principles stated in the EBU Technical Report 028, 'EBU Policy Statement on Ultra High Definition Television,' where applicable, tests will be carried out using those parameters (or a combination of them) that provide a more immersive viewing experience, such as improved frame rate, wider dynamic range, extended colour gamut and enhanced audio.

The initial study areas will be:

- HEVC/H.265 coding trials linked to UHD-1 and HD over DVB-T2 transmissions, as well as UHD-1 over DVB-S2. SAPEC, Cellnex Telecom and Hispasat will collaborate in these trials, keeping in mind a possible nation-wide deployment in all of the cases.
- Exploring the possibilities of the MPEG-DASH standard, analysing its capability to generate adaptive streaming for the distribution of online channels that avoid, to the extent possible, problems experienced by users such as signal cuts, reduced AV quality or delays at the start of viewing due to changing network conditions. HD and UHD-1 trials are planned.
- Multichannel sound for UHD-1 in Dolby Atmos.
- Carrying out, if possible, some eMBMS experiences in LTE networks, in order to identify real and useful use cases in which this technology could be a complement for the broadcasting services.

The first phase of the trials has just begun and is focused on DVB-T2 transmissions. The Chair has approved a test plan based on four modes. Each mode is configured with a combination of DVB-T2 parameters that maximize the data rate while retaining the current national network design and coverage (i.e. outdoor fixed reception, equal or higher protection ratio and similar minimum median equivalent field strength).

Nowadays a DVB-T2 multiplex is being transmitted from the Telecommunication Engineering School than contains three programmes with different video coding for initial comparison purposes: HD AVC/H.264, HD HEVC/H.265 and UHD-1 HEVC/H.265. These programmes are received at RTVE Institute, where several TV sets capable of decoding them have been placed.

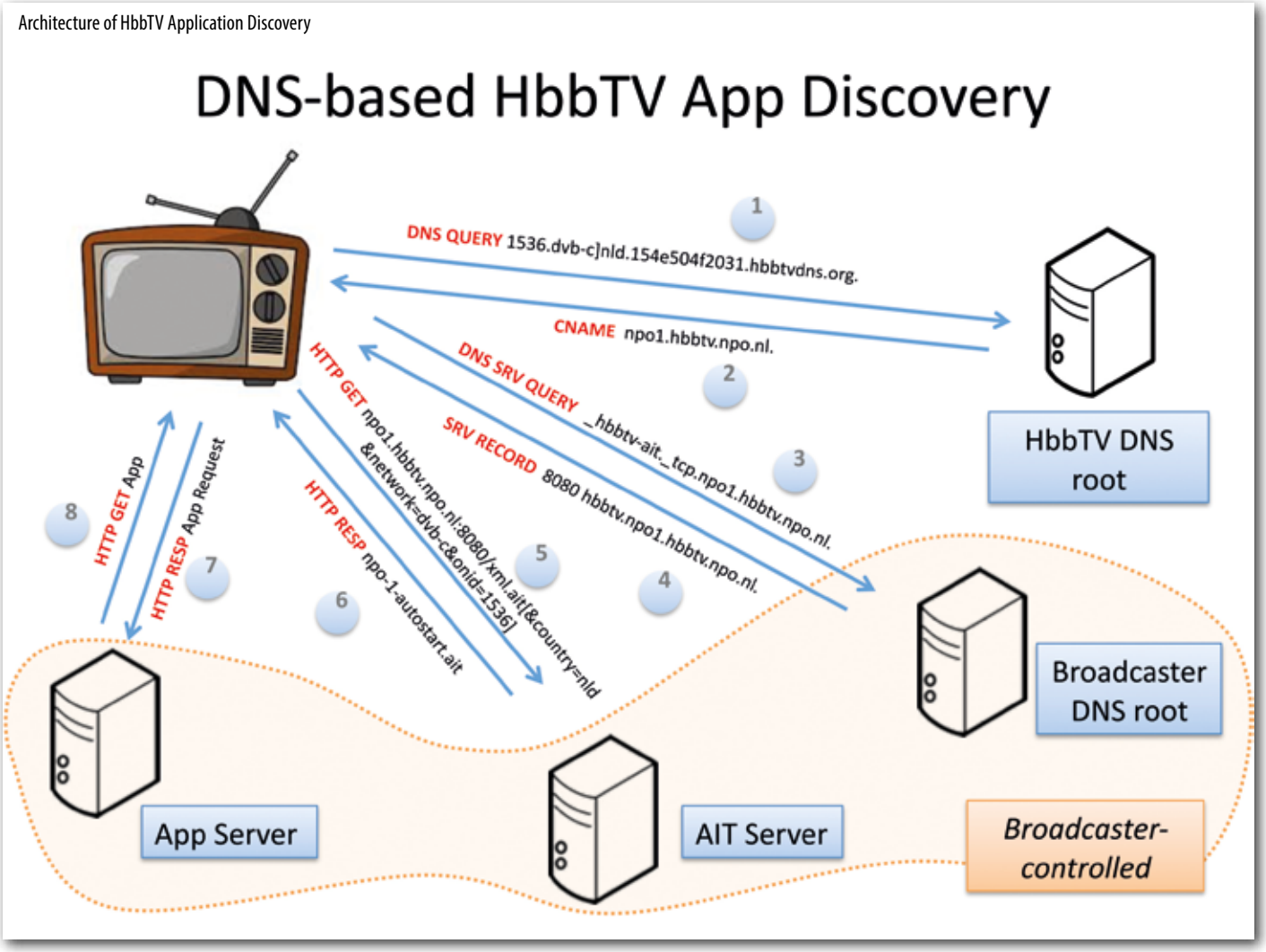
It is also expected that DVB-T2 field trials and subjective/objective video tests will start soon, and new UHD-1 RTVE contents will soon be available for demonstration purposes.

CREDIT: RTVE – UPM ETSIT CHAIR

HbbTV application discovery over broadband

CAN HBBTV STILL WORK IF THE "TRIGGER" DOES NOT REACH THE TERMINAL? **ROB KOENEN** (TNO) AND **JOOST NEGENMAN** (NPO) EXPLORE THE OPTIONS.

Architecture of HbbTV Application Discovery



Readers of tech-*i* know that HbbTV offers great potential for broadcasters. But even when the terminal is connected to both broadcast and broadband signals, the HbbTV Application Information Table (AIT) may not reach the terminal. The television may understand HbbTV, but perhaps it might be connected by HDMI to a set top box (STB) that does not. Or the network operator that carries the broadcaster's DVB signal leaves the AIT out. This is the case in some channel/network combinations in for example, The Netherlands. It would seem like its "game over" for HbbTV in such situations … but perhaps there is still something we can do? This is the question that NPO (The Netherlands Broadcast Organisation) and TNO (The Netherlands Organisation for Applied Scientific Research) raised in HbbTV.

Why should NPO make such an effort to bypass outdated peripherals or reluctant network operators? Hybrid TV holds promise for linear TV enrichment and is the platform to other broadcasting affiliates' applications. Faced with the increasing popularity of standalone video platforms, the EU-supported HbbTV platform is hybrid, and its easy access provides a logical step ahead. Besides the ability to stretch linear viewing to catch-up and on demand AV services, the HbbTV platform can be the perfect instrument for personalised access services. Access services personalised to the specific needs for individual viewers, can start with personalising subtitles or audio tracks, and can go as far as adding sign language for the deaf and hearing impaired.

HbbTV may not work...

The Hybrid broadcast-broadband TV specification merges the broadcast and broadband worlds. An HbbTV App can be sent in the DSM-CC carousel much like teletext, which is useful when sufficient broadcast bandwidth is available and large broadband bandwidth is not. This can be true for satellite transmissions. HbbTV can also work by sending only an Application Information Table (AIT) in the broadcast carrousel, with the App loading over broadband. This is often done for terrestrial transmission, and NPO's HbbTV deployment works this way. Unfortunately, sometimes the AIT does not reach the HbbTV terminal. We can distinguish two different cases:

- Case 1: the terminal receives a DVB signal (terrestrial, cable or satellite) but the AIT is not carried in the multiplex, in spite of the broadcaster making it available to the service provider.
- Case 2: the TV is connected to a STB that does not support HbbTV. The connection is likely to be an HDMI cable; SCART is also

still used. The AIT may or may not be carried in the signal that terminates in the STB, which could be a legacy device that is simply too costly to replace on a broad scale.

We have been working on enabling HbbTV in the absence of broadcast signalling for about a year. Our goal is for the HbbTV Association to publish a method for "HbbTV Application Discovery over Broadband," as announced at BroadThinking 2015. Since the "bb" in HbbTV stands for "broadcast broadband," this makes sense: we will add a broadband-based discovery method to the broadcast-based signalling that is already specified.

Requirements

The two cases require slightly different solutions. The fundamental approach, however, is the same: the terminal must understand what channel is playing, and where to get the AIT that goes with it. That's all. Let's take a brief look at the most important requirement needed:

- Trust is crucial. An HbbTV terminal that discovers an application independent of broadcast signalling must be 100% certain that the app originates from the broadcaster that owns the channel.
- Security is increasingly important in HbbTV. We need to ensure the integrity of any broadband-discovered App.
- Next to security and trust in importance is privacy. Discovery must not divulge privacy-sensitive information to entities that are involved in enabling the discovery.
- In some of the countries where our solution will be deployed, regulators and lawmakers do not wish to make operator support of HbbTV mandatory. Therefore, the solution must not depend on regulatory measures, but we can rely on net neutrality.
- A terminal must know when to invoke App Discovery over Broadband, and when not.
- When the AIT is not carried in the broadcast, then application signalling updates are probably not available, either. The new App discovery method 'should' support signalling - note that this may be difficult, so it's not a "shall".

Identifying the channel

So how can we identify the channel? In Case 1, the DVB case, metadata is available in the digital broadcast that can be used. We require metadata that is always present, and unambiguous. Our first candidate was teletext, which has standardised Country and Network signalling. It would solve the problem very nicely in countries where it is available - such as The Netherlands - but it's been switched off in quite a few countries already, so we had to look elsewhere. The next candidate was DVB-SI information, which is available in all DVB broadcasts. The DVB Service Name was selected.

No digital metadata will be available for Case 2. We considered a number of alternatives, including Automatic Content Recognition (ACR) technologies such as fingerprinting and watermarking. Fingerprinting would require a large IT infrastructure and constant communication from the terminal (always a TV in this case) to some central server, as the TV has no way of detecting channel changes - so this option was quickly dropped. A video or audio watermark can easily carry a channel ID. Video watermark extraction will require native support in chip sets. Audio watermarking is an option, but it wouldn't work if the audio were muted on the STB. Whichever we use, the watermark needs to be standardised for this solution to work. Fortunately ATSC is far along in the process of standardising watermarking for ACR for ATSC 3.0. ATSC's requirements are a superset of ours: while we only need to know the channel, ATSC also seeks to signal the date and time in the watermark. If all goes according to plan, ATSC will finalise its ACR specification soon so, that HbbTV can reference it in the future.

App discovery

After the Channel ID is known, the next step is to start a discovery process. Here is an example that shows the principles:

1. With the DVB Service Name, construct a unique ID;
2. With the unique ID, request the AIT server address from a resolution service;
3. With the server address, request the AIT;
4. With the information in the AIT, retrieve the HbbTV App.

From step 4 onwards, things work the same as for broadcast-signalled HbbTV.

The address of the central resolution service would be hard-coded in the terminal. It can be market-specific, but since many viewers receive broadcasts from multiple countries, a better solution would be to make it broader, like a single service for Europe.

A very similar discovery problem has already been solved by RadioDNS, and our solution follows RadioDNS's model, which has the major advantage that we can leverage the distributed Domain Name Service system.

Arguably, the most difficult issue is supporting stream events. This is a fundamental problem: without broadcast signalling there are no stream events. However, since an HbbTV app is essentially a web page, web technologies can be used for setting up a communication channel between app and server and updates can be communicated that way. Options include the use o f web sockets and forms of polling. A broadcaster knows when it is serving an app based on broadband discovery, so it can serve an app that takes the absence of broadcast signalling into account. The protocol states that if a broadband-discovered AIT is available, it should only be used when no AIT appears in the broadcast after a few seconds - so broadcast signalling always takes precedence.

Problem solved?

Does this meet our requirements? We think so. The solution is secure, as https can be used for the non-DNS steps, and when DNS itself is hacked, there are more urgent problems. (A secure DNS spec, DNSSEC, exists and can be referenced if it gains traction). The solution can be trusted by broadcasters, TV makers and viewers, since the broadcaster will be in control of registering unique IDs for its own services. The solution respects privacy, because we will specify that DNS look-ups should only happen once per 24 hours, and not on channel changes. There is no party that can glean, from this discovery method, what channels are watched; an entity operating a DNS server can at best learn what channels are available at a certain IP address.

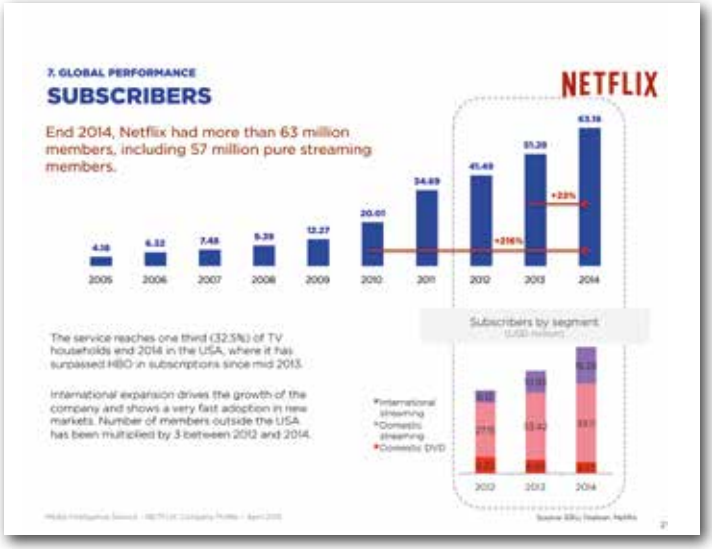
HbbTV still needs to finalise the spec, but we are confident that this can be done soon. The solution would then apply to all HbbTV versions, including 1.2, 1.5 and the recently published 2.0.

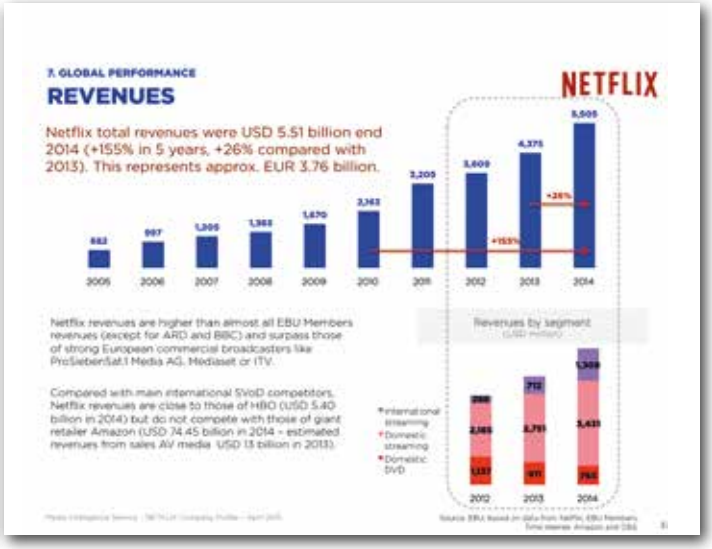
Contacts: Rob Koenen (rob.koenen@tno.nl) or Joost Negenman (joost.negenman@npo.nl).

Screen shot from NPO

Everything you need to know about Netflix

As we know, the media landscape continues to change at a rapid pace. We often talk about our Members' work in tech-*i*, but less often about our competition. The Media Intelligence Service of the EBU develops company profiles to get to know the competitive landscape. Take a sneak peek at our recently updated profile of Netflix.





To access the full profile, visit the Media Intelligence Portal at: www.ebu.ch/mis.

What's in the Sandbox?

THE FUTURE FOR USER EXPERIENCES AND BRANDING ISN'T JUST CREATED. IT WILL BE CO-CREATED. **KOEN MEYSKENS** (VRT) AND **FELIX POULIN** (EBU) TELL US WHY.

Just like climate change, one cannot deny the drastic evolution affecting the media industry at every level today. New technologies are driving consumer behaviour - new ways of storytelling are transcending technology, consumers are becoming content producers, not to mention the impact of Generation Y audiences. Globalization has played a key role in the rise of disruptive, yet innovative start-ups that push the boundaries of the media world. With these changes come great expectations for media organisations to respond and listen more to their audiences and better meet their needs.

So, what next?

We can postulate a vision, talk about strategy and brainstorm ideas to give meaningful guidance towards setting shared goals and objectives, but it is nearly impossible in this fast changing landscape to define a fixed roadmap for years to come. Instead, we must learn to adapt on the way to tomorrow.

In order to be able to deal with change in a flexible way, we need to move from rigid structures to a more fluid and agile organization. And this has an impact not only technologies and structures, but also on culture and mind-set. Remember how Atari attracted engineers in the 70s? Feel good and have fun was the basis for creativity.

Moreover, it is hard for media organisations to keep up with all of the media evolutions and technologies. Just think of the vast amount of use cases like with the introduction of wearables, augmented reality or the usage of big data to name a few. To benefit from these disruptive innovations we need to better connect with the many start-up organizations in Europe. They are in fact the ones trying to fill in the gaps and even cause disruption, so why not join them?

"Companies and technologies are being embedded within a broadcaster, giving them access to what really matters"

A new model of collaboration

Together with iMinds and the EBU, VRT has been evaluating this shared vision of on premise collaboration in the eco-system of a broadcaster. In its Sandbox experience, companies and technologies are being embedded within a broadcaster, giving them access to what really matters: not a lab environment, but real access to creatives in the media industry, technological platforms, operational teams and actionable feedback based on clear insights from their target audiences. It gives them the opportunity to improve and better validate or valorise their products and being associated with strong brands.

For a public broadcaster, such collaboration provides lean and fast insights into the wide variety of use cases, technologies and ideas. It also brings the dynamic "startup spirit" stimulating the bigger, slower organisation. Our first experiences shows not to choose heavy processes, but rather to use a lean approach, time-boxed with a fail fast attitude to guide the projects.

By learning and leveraging what works and what does not work, it enables everyone to really focus on what adds the most value, accelerate the developments and generate more sustainable business models. In collaboration project risk is shared, but more importantly, so are the benefits.

The first results

The Sandbox has finalized its first round of projects at the end of March. A number of technologies were successfully experienced ranging from metadata management and entity extraction, storytelling and engagement with interactive video, predictive analytics, actionable dashboards, HTTP live streaming with HTML5 video playback, behaviour mapping and reliable network transfers. The next cohort of companies is now intensively engaged in the Sandbox until the end of June. And many more ideas have already been generated in the passionate discussions between all the collaborators.

The future for user experiences and brands isn't just created, it will be co-created. Therefore it is time to be open-minded and find new usage scenarios, not originally considered. Embrace change and evolution and discover the many advantages of partnerships. Experiment and validate the reach with new touch points, form factors, technologies and ways of storytelling. With Sandbox, we support these collective challenges and help to emerge and evolve innovations and entrepreneurship in the media industry. This is being done in a cost effective way by providing floor space, legal guidance and access to a connected broadcast organization with a successful partnerships of VRT, the EBU, and iMinds.

Join the EBU Open Source Community for Broadcasters

NOWADAYS OPEN SOURCE SOFTWARE IS PART OF OUR EVERYDAY LIFE. **MATHIAS COINCHON** (EBU) SHARES THE NEW EBU OPEN SOURCE COMMUNITY FOR BROADCASTERS.

It's been a while since we started to engage in the topic of open source software for broadcasters at the EBU. In 2007, our first Open Source Seminar was about demystifying the topic and showing that there were relevant and growing projects for broadcasting too (it wasn't just about IT).

Nowadays, open source software is part of our everyday life. We see it on our mobiles, in our home routers and most of all on social media and new platforms like Twitter and Netflix. It has become a new way to standardize and also a way to democratize innovation and attract talent. In broadcasting, we find open source software in playout, contribution, headends, and web platforms either as components or sometimes as full platforms.

Since our event in 2007, the EBU has organized or taken part in many activities related to open source. Nearly 100 people participated in our second Open Source Meet-up at IBC last year – a sure way to see the growing demand for a community. We've also participated in the creation of a media track in the Libre Software Meeting (LSM/RMLL) and more recently at the Free Open Source Developer Meeting (FOSDEM)* in Brussels, the largest open source related event in Europe with more than 5000 participants.

In parallel, the team has worked hard to create the EBU.IO Platform to share software developments under the umbrella of our strategic programme on Agile Software Collaboration. Each autumn we host our annual EBU Developer's Conference (DevCon) which attracts a similar audience to delve into the agile environment.

Despite all of these activities, the remaining task for us was to build a strong community around open source software in broadcasting that could include non-members, as well as Members, and connect existing media projects like the videolan community. So this is what we've done. The new EBU Open Source Community is an informal group without an official Chairman. You may call it anarchy but "do-ocracy" is what we do. At the moment, the group consists of a mailing list, a wiki page and a webpage on our tech.ebu.ch site.

Willing participants of the group send announcements, ask for information related to projects and inform others about their projects. The idea is that the group will continue to evolve and follow an organic development over time. While writing this, I've noticed that 52 people have already signed up to the group, including broadcasters, representatives from the industry, integrators and online platforms. If you're interested to join the discussion or learn more about what we do, see: https://tech.ebu.ch/groups/opensource . A list of software projects related to broadcasting is also available at http://ebu.io/opensource and we are more than happy to have your ideas!

*FOSDEM presentations and video: https://fosdem.org/2015/schedule/track/open_media/

Subtitle distribution at the BBC

WHY IS MPEG-DASH IMPORTANT FOR FUTURE PROGRAMME DELIVERY VIA THE INTERNET? **FRANS DE JONG** (EBU) TELLS US MORE.

"MPEG DASH is the BBC's preferred technology for future programme delivery via the Internet. To make these programmes as accessible online as they are on television, they need to be accompanied by high quality subtitling. To achieve this technically, the BBC has been performing tests on the EBU-TT-D subtitling format in an end-to-end context. The testing has shown EBU-TT-D indeed provides the necessary functionality to allow end-to-end subtitle streaming.

The tests were done with prepared subtitles, but as the EBU-TT-D was broken up in 10 second chunks, the approach should in principle work for live subtitling as well. Both prepared and live subtitling are of prime interest for the UK broadcaster. Since the first announcement on the work in February of this year, the BBC team has added multiple regions support to the set up.

Other BBC work related to this topic includes user research to establish how various factors impact on the perceived quality of subtitles and how subtitles can be monitored and improved. This includes investigations into subtitle reading rate, positioning of the text and the development of personalization of subtitles by formatting subtitle blocks in the client. For more information, see: http://www.bbc.co.uk/rd/projects/live-subtitle-quality

It is with mixed feelings, both happy and otherwise, that we report the departure of Yvonne Thomas from the EBU Technology & Innovation team in August 2015, to pastures new in Germany. We are obviously happy that Yvonne is moving on to a new and very likely challenging phase of her professional life – we know that Yvonne loves a challenge – but we have a certain sadness for the departure from our department of such a great colleague, whose presence here these last five years has enriched the EBU both professionally and socially.

Yvonne was our original 3DTV "3Diva" who coordinated the EBU work effort on that bit of (now) televisual history, she then moved on to coordinating EBU investigations into the effects of LED and other low energy lighting on television colorimetry and most recently, the study of high dynamic range (HDR) and high framerate (HFR) as they apply to UHDTV. All of these activities have led to EBU publications, but also to ITU, SMPTE and DVB standardization efforts.

Apart from her obvious technical talents, we'll miss Yvonne for her good nature, her organizing capacity, her clear-headed thinking through a process and her capacity for hard work; our IBC is going to be much more involving for the rest of us this year!

Yvonne, we wish you all the best for the future! (Keep in touch)

Y-NOW: Understanding young audiences

THEY SAY INNOVATION IS NOT A PROCESS, BUT A STATE OF MIND. **MADIANA ASSERAF**, EBU, TAKES A CLOSER LOOK AT ENGAGING YOUNG AUDIENCES

Being more relevant to younger audiences is not only one of the recommendations of the Vision2020 report, but also and a crucial move for public service broadcasters if they are to remain relevant to the audiences of the future. It is therefore a priority for the EBU to support our Members to understand and reach young audiences more efficiently.

As a result, we have created an internal group of multidisciplinary, innovative and mainly young professionals. Our task is to exchange ideas and share knowledge to understand the digital natives and their media consumption habits and trends.

The group took as its starting point a series of interviews with our Members: around 40 Members from more than 20 different organisations. In most cases we heard from programme managers, channel managers, producers, editors and strategists. The aim was to find out what public broadcasters are already doing to reach younger audiences, what is working, what needs to be improved or developed further, what the next steps in strategy will be and how the EBU could help.

We talk about young audiences as the millennials or digital natives; the also so-called 'Youtube generation', a generation that has changed the way media is consumed and perceived. EBU Members are of course already implementing and experimenting new ways of reaching this generation: online thinking, social media and user-generated content, the 'wow' factor, humour, music discovery, real-world connectivity, on demand products and finding the right approaches to tell stories. These are some of the key elements to create brands that look younger and are more appealing to digital natives.

But, this is not always enough and public service broadcasters have suggested that they face several challenges in reaching young audiences, including the complexity of internal processes, legal restrictions, lack of creativity, and often a definition of Public Service Media that's just too old for the young generations. The trend is rapid and undeniable. So what actions can be taken?

"We have to transform our mindsets, because media is nowadays consumed in a completely different way; it is a different world."

One thing is clear: being present on all platforms to reach the digital generation wherever they are is the way for public service broadcasters to fulfil their function of reaching all of their audience. But the 'what' is done online or on-air is not the most important to reach younger audiences: it is the 'how' this is done that matters. Offering our audiences relevant and high-quality content above all to guarantee the excellence and raison d'être of public service media, combined with an open mindset that fosters creativity and innovation; a mindset that is not scared of taking risks and sometimes failing. Indeed, failure is part of the innovation process; perhaps even the most important part of it.

Taking risks and daring to fail is what some EBU Members have been doing through their recently created digital innovation labs: small teams of multidisciplinary, creative and talented professionals experimenting with new products for online and with new ways of storytelling in order to be quickly responsive to market changes. The engines among these labs are shared: dialogues and interactivity; more content for online and mobile; more products designed for streaming and on demand; more social campaigns to go beyond the traditional role of public service broadcasters to become active citizens together with young people. Finding simple ways of doing complex things is part of the game: if a project can't be launched within two or three months, it is discarded; and if it is prototyped and the audience doesn't show an interest in it, it is progressively adapted to the feedback received and evolves as the users imagine it.

The EUROVISION Y-NOW group was set up to encourage and share creativity and innovation. A series of visits to the digital innovation labs, workshops, documentation gathering and creative exercises about and with digital natives will be produced in the following months. The aim: challenge our peers to think differently and produce new (and crazy) ways to thrill the digital natives and make public service media indispensable for them. Because they say innovation is not a process, but a state of mind. And we aim at making innovation become a habit, not just a random act. Don't be afraid to fail. Be afraid not to try.

To access the complete summary of interviews with Members, see: http://www3.ebu.ch/files/live/sites/ebu/files/Publications/Reports/YOUNG_AUDIENCES_REPORT_updateFeb2015_web.pdf. For more information, please contact: asseraf@ebu.ch

Opening up hybrid TV for all

FRANS DE JONG (EBU) GIVES US THE INSIDE SCOOP ON THE LATEST NEWS FROM THE HBB4ALL PROJECT

"Making HbbTV content accessible for all," is the goal of the European HBB4all project, which has been running just over a year now. At its second Advisory Board meeting in March 2015, the project partners shared their latest work, showing how HbbTV is becoming an all-compassing platform, but also what hurdles still need to be addressed. Three examples were highlighted:

Signing over IP

EBU Member RTVE shared a pragmatic approach to provide a signing in service to HbbTV platforms which took their developers about one month to implement. RTVE simply transmits a fully signed ('burnt-in') programme to the viewer over IP. This allows the service to be used with many current hybrid TVs and the number of streams provided gives a good indication of the uptake of the service. There are some drawbacks, however. These include: the service parameters (e.g. position of the signer) cannot be changed by the viewer, the bandwidth consumption rises with the amount of users, and the encoding is less efficient than when using an overlay (because the full picture needs to be encoded again). That is why the HBB4all Consortium currently implements a hybrid approach that combines the normal broadcast with a signer delivered over IP. The big obstacle for this approach is the limited support for this scenario in CE devices, a point which has been raised with the television manufacturers participating in the Consortium's meeting.

EBU-TT-D subtitles

Catalan broadcaster TV3 focused their demo on subtitling, more specifically on rendering EBU-TT-D subtitles on HbbTV devices. They have already converted many subtitle files into that format to be ready for the distribution of its content to hybrid TV. The presented TV3 implementation provides basic rendering and limited styling options (e.g. colours), which are currently being added. Later on they will shift their focus to personalization, so users can change the subtitle presentations according to their own needs. Similar work is being performed by the German partners in the Consortium. EBU Member RBB expects to start testing customizable subtitles for their HbbTV services this summer.

NER software

A third example of how the HBB4all work bridges the accessibility gap is the NERstar editor, an application that can help assess the quality of subtitling services. This software is the brainchild of various industry experts, including Gion Linder from SWISS TXT and Robin Ribback of VerbaVoice. By logging precisely when words are shown on screen and by comparing these with, for example, the programme's transcript, NERstar can help improve subtitling timing, punctuation and even the Automatic Speech Recognition models of live subtitling systems.

More information at: www.hbb4all.eu

The NER model

The NER model assesses the accuracy rate in live subtitling by analyzing the extent to which errors affect the coherence of the subtitled text or modify its content.

$$\text{Accuracy} = \frac{N - E - R}{N} \times 100$$

N = Number of words, E= Editing errors, R = Recognition errors

The NER model delivers scores which are internationally comparable, auditable and relatively consistent. It has been well received by broadcasters, subtitling companies and regulators in many countries, including Australia, Spain and the UK .

For automatic subtitling there is eNER (extended NER), which takes into account further variables such as the accuracy of timing, punctuation and speaker change errors.

$$eNER = \frac{(N \times P) - \sum_{i=1}^{n}(R + S + T + SP)}{(N \times P)} \times 100$$

More on NER and the software: speedchill.com/nerstar

The importance of 5G

DARKO RATKAJ (EBU) TAKES A CLOSER LOOK AT HOW 5G COULD POTENTIALLY OPEN NEW POSSIBILITIES FOR THE EBU MEMBERS

There is currently no agreed definition of '5G'. For some people it means a new wireless technology that will come after 4G/LTE. For others 5G is about enabling the 'Internet of everything' which would fundamentally transform the way we live and work. Many 5G advocates expect the future wireless networks to be able to provide ubiquitous connectivity, 'infinite' capacity, 'zero-latency', and be significantly more spectrally, energy, and cost efficient than the current ones.

Until recently the 5G meant little more than R&D efforts towards novel wireless radio technologies and network architectures. However, in the last 12 months it has gained a global momentum that extends far beyond the research community. Whilst the mobile technology vendors and operators actively promote their respective visions of what 5G should be, many national authorities and the European Commission have declared their undivided support to 5G developments. In addition to the substantial R&D funding, a policy and standardisation framework is being put in place to ensure that 5G is ready for the market by 2020.

Large scale delivery of video content is considered to be one of the key use cases in the '5G world'. This is important for EBU Members as they seek to reach the increasingly popular mobile devices. Furthermore, the traditional radio and TV receivers may in the future also be capable of connecting to 5G networks. This would make 5G an important delivery platform for the whole range of audio-visual services.

Hence, 5G could potentially bring new possibilities for EBU Members but only if it can accommodate their future needs. The EBU's Technical Committee recognizes that the 5G performance requirements are currently in the process of being defined and has requested the Strategic Programme on Future Distribution Strategies to formulate and promote the future Public Service Media requirements for wireless distribution of content and services. EBU Members are strongly encouraged to join this work: https://tech.ebu.ch/groups/fds

In my opinion: is hybrid the new teletext – or something else? **DAVID WOOD**

Many years ago I was part of the development of Teletext. Do you remember it? It was a system to offer viewers, in addition to their TV programmes, screens of text and/or lumpy graphics. Coded digital data is hidden in the space above the image, and re-assembled as a text/graphic display in the TV set. I once gave a demonstration to the Australian media boss, Kerry Packer. He asked me how, in advertising-funded TV, he could make money from Teletext. Teletext allows up to 24 rows of text on a 625-line TV screen, so I suggested that the top 23 lines could be taken up with the broadcasters' text, and the bottom line with an advertisement. "No", he said "I'd rather do it the 'Australian way'- one line of broadcasters` text and 23 lines of advertisements".

Teletext became widely adopted throughout the world (except in the United States) without Kerry's (tongue in cheek) idea. Of course new media needs to be funded, but public service broadcasters saw themselves at that time as pathfinders whose mission was to provide the public with the best that technology could offer from their own resources – to lead the local industry forward. They provided Teletext, and private broadcasters followed suit- both because they also had certain public service objectives, and because they needed to be competitive with public service broadcasters.

Public service broadcasting plays/played a smaller part in the United States, and not offering Teletext services did not mean a loss of competitiveness. Though in any event, the text content per screen there was going to be smaller (NTSC has 20% fewer scanning lines than PAL and SECAM), the bottom line there was that there was no commercial case for offering Teletext in the US, and this was a

condition of its use.

If we 'fast-forward' to recent years we find ourselves in a similar situation in some ways. We have a much more sophisticated system for enlarging the TV experience television with the different systems of hybrid or integrated broadcasting, bringing Internet content to the screen as well as the broadcast.

The set makers themselves initially equipped televisions with the capacity to receive and display purpose-designed web services, which included audio and video. The initial services they offered had a novelty value, but they were not as successful as the set makers hoped.

More and more set makers took up the common HbbTV system in addition to their own systems. HbbTV can provide everything that Teletext ever could - and a lot more besides; any amount of background information about a TV or radio show, schedules, weather, games, and anything that creative people can devise.

HbbTV services are essentially web gateways provided by broadcasters. One of their advantages is the direct link to broadcast programme content itself. We imagined in broadcasting that this would be a killer advantage compared to the systems provided by the set makers themselves. Viewers want to talk about, link to, and hear more about the TV programmes they like.

In the United States, hybrid systems of this kind have not been taken up. Instead web based delivery of video media of relatively high quality has become a major success, sometimes with, and sometimes without, separate set top units. The service becomes a virtual cable network with a huge number of programmes on offer. This is '0TT' (Over The Top Television). The choice of content for the user is huge and the subscriber costs are low. This formula is now being taken up across the world. These systems are successful because they make money. If you ask broadcasters in the US if they will take up an HbbTV type system, they ask how they should find the costs of providing it.

But Hybrid systems like HbbTV can also be used to deliver video in the same way as OTT, and thus an issue of the time is whether the future will see them gravitating towards OTT type services - delivering whole shows - or whether they will also retain a role in providing what might be called a very much better Teletext service. All this in a world where increasing use is made of simultaneous tablet and TV viewing. Though broadcasters now live in a very different age to the one when it was developed, Teletext remained in use for over four decades. Maybe providing additional information services to accompany broadcasts is simply a very good idea, and it will stay the course at least outside the US. What do you think?

Using Spectrum for public protection and disaster relief services

SPECTRUM PLAYS A VITAL ROLE WHEN IT COMES TO PUBLIC PROTECTION AND DISASTER RELIEF. **WALID SAMI** (EBU) EXPLORES THE OPTIONS AND CHALLENGES.

The Conference of European Postal and Telecommunications Administrations (CEPT) have set a target to identify 2x10 MHz of spectrum below 1 GHz for Public Protection and Disaster Relief (PPDR) before the World Radiocommunications Conference (WRC-15) in November 2015.

To do so, Project Team FM49 (a sub-group of the Working Group 'Frequency Management') has undertaken the task to identify the frequency bands and tuning ranges below 1 GHz and define options of channelling arrangements for PPDR in these bands. In parallel, Project Team SE7 (a sub-group of the Working Group 'Spectrum Engineering') is in the process of carrying out the required technical sharing and compatibility studies for the different options in order to verify their feasibility and to define the technical conditions for their implementation.

Studies have been focusing on two frequency ranges: the 700 MHz band (694-790 MHz) and the 400 MHz band (450-470 MHz). Both frequency ranges are immediately adjacent, upper and lower respectively, to the UHF broadcasting band 470-694 MHz used for DTT.

There is no mandate so far from the European Commission to the CEPT to harmonize the use of certain frequency bands by PPDR throughout Europe. However, FM49 has introduced the concept of "Flexible harmonization" which defines harmonized technical conditions for each frequency band option but leaves to the Administrations the choice of the frequency band option which suits best their national needs.

Both Project Teams foresee finalizing three ECC reports by the end of May 2015 so they can be sent for public consultation and published before WRC-15.

What are the challenges?

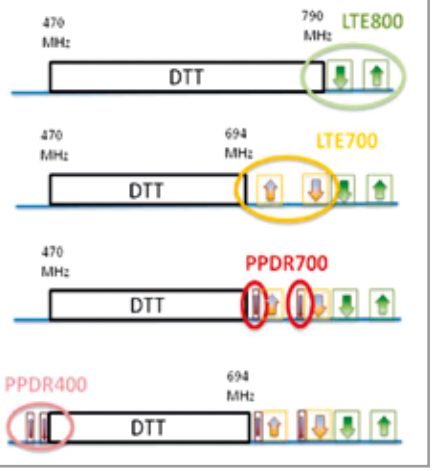
Figure 1 shows the respective spectrum configurations of LTE800, LTE700, PPDR700 and PPDR400 with regard to DTT UHF spectrum.

As shown, the PPDR700 uplink is foreseen in the guard band initially set between the DTT band upper limit (694 MHz) and the LTE700 uplink.

The PPDR 400 downlink is foreseen immediately below the DTT band lower limit (470 MHz).

The main issue of the PPDR700 for DTT is the implementation of the PPDR uplink in the guard band above DTT channel 48, precisely in the band 698-703 MHz. This reduces the guard band between channel 48 and the PPDR UE transmissions to 4 MHz, compared to 9 MHz for the LTE700 UE transmissions. This reduction of the guard band creates two challenges:

Figure 1- Spectrum configurations for PPDR and LTE



1. The selectivity of the DTT receivers is worse with 4 MHz than with 9 MHz.
2. With this reduced guard band, it is more difficult to limit the OOBE level of the PPDR UE to a sufficiently low level (e.g. -42 dBm/8 MHz or lower) in channel 48. This requires further improvement of the filters to be used in the PPDR user equipment.

Furthermore, the use case of vehicle mounted PPDR UE increases the radiated interference level by around 7 dB above that of an LTE 700 MHz UE (0 dBi gain instead of -3 dBi and absence of 4 dB body loss). In addition, in special events like emergency situations or demonstrations several PPDR UE can gather in one hot spot, which results is aggregated interference into DTT around the event location. A reduction of the vehicle mounted PPDR UE would be required, unless mitigation techniques can be found and implemented to reduce the impact on DTT from this type of equipment.

Concerning the PPDR400, the main issues for DTT are:

1. The **PPDR base station** transmitting immediately below channel 21 can be compared to the LTE800 MHz case, where the Base station frequencies are close to DTT channel 60. Similar concerns would therefore be expected in terms of interference to the DTT receivers and amplified reception installations located near the transmitting base stations. Therefore similar provisions would be required from Regulators and PPDR network operators to solve the possible interference cases. i.e setting an appropriate low level of the out-of-band emissions of the PPDR base stations and adding rejection filters to the affected DTT receiving installations.
2. Another issue is the high power of the **PPDR User Equipment mounted on vehicle**. Its e.i.r.p can be up to 37 dBm (5 W) compared to 23 dBm (0.2 W) for the LTE user equipment in the 700 MHz band. Such a high power for a UE might cause interference to the reception of channel 21 at short distances and could overload active receiving installations for any received DTT channel. As mentioned for the PPDR700 case, a reduction of the vehicle mounted PPDR UE would be required, unless mitigation techniques can be found and implemented to reduce the impact on DTT from this type of equipment.
3. The third issue is the **Out-Of-Band-Emission limit of the PPDR UE**. Its level needs to be set at least to the same level as for LTE700, or to a lower level, in order to limit the overall impact on DTT to a similar level.

What are the requirements for broadcasters?

The studies carried out by the EBU, EBU members, BNE and some Administrations (like the UK's Ofcom) show that the impact of PPDR 700 and PPDR400 may exceed that of the LTE700 and LTE800 unless suitable measures and limitations are applied.

In order to prevent this, broadcasters' requirements are based on the principle that the impact of PPDR700 and PPDR400 to DTT should not exceed that of LTE700 and LTE800. This principle takes into account the agreed levels for the impact of commercial mobile systems and therefore does not penalize the PPDR systems.

Next steps

The CEPT Working Group on Spectrum Engineering (WGSE) approved two ECC Reports 239 and 240 on PPDR 700 and PPDR 400 respectively. They show the final proposals on each of the issues above and will be sent for public consultation which will be closed most likely in early August.

The ECC reports above can be downloaded from: http://www.cept.org/ecc/groups/ecc/wg-se/client/meeting-documents

VYTAUTAS PLYTNIKAS

LRT launches a remote studio in the Lithuanian Parliament (Seimas)

ARNAS ZUIKIS (LRT) REVEALS HOW LRT SEEKS TO BECOME A MAJOR PLAYER IN THE BALTIC REGION.

LRT, the Lithuanian public broadcaster with 4 TV channels (including one HD channel – LRT HD) and 3 radio channels, seeks to become a major broadcaster in the Baltic region. Being an innovator and a pioneer in the implementation of the newest technical solutions, LRT faces many day-to-day challenges. However, that has not stopped them from launching their latest development – a remote studio for securing communication with one of the governing state institutions, Parliament, at any given moment, and without the involvement of a filming crew.

At the beginning of 2014, LRT started creating the concept of a remote TV studio which would connect the TV production studios and remote locations in the country.

Arnas Zuikis (CTO of LRT), says, "We were searching for better ways of doing live interviews, from several places, without sending TV crews to these locations. We have some camera units with compact video streamers, which we usually use for live interviews. But we wanted to have a better solution in some fixed places. Lithuanian Parliament is one of the locations that we work on a daily basis".

With at least seven hours of news and current affairs production everyday on the prime channel, LRT decided to optimize its recourses and instead of sending TV crews daily to the Parliament, it decided to build a remote controlled studio. There are many solutions pertaining to constructing such a studio, but LRT decided to take advantage of using the teleconference system.

The teleconference and video conference communication model for live TV transmissions is a world-wide innovation, implemented with the help of Cisco which allows companies to seize the opportunities of tomorrow by proving that amazing things can happen when you connect the previously unconnected. The launch of this remote studio enabled the Lithuanian public broadcaster to save its funds, since there will be no need to send journalists and cameramen to do interviews and special reports, which is a daily routine in the country's main governmental institutions. The interviewees, when needed, will have the opportunity of addressing audiences directly, without intermediaries.

The teleconference equipment provides the HDTV signal over the Internet with almost no delay, and an interviewer can hear questions from the programme host at the same time as TV viewers. Thus, it will enable avoiding those several second lags in transmissions that we have had in place until now.

The remote studio has two cameras installed - one in the front and one in the back for a "beauty shot", a 65 inch curved TV screen, an ambient lighting system, remote controlled TV lights and a microphone are fixed in the stand. In the remote studio it is possible to do an interview with up to five persons.

The studio stand is simple and easy to use. People who were using the system said that interviews went well and they felt comfortable and confident with it. On the stand in the remote studio there is only one button that can be used by an interviewee – the mute button of the microphone. The microphone may also be muted remotely from the TV studio.

The key benefit of video conferencing is the fast production in doing a "hot" interview. Our TV channel can deliver the latest news from the Parliament extremely fast. For interviews or reports of the latest news, the journalist only has to invite the interviewee to come to the remote studio, and an interview or announcement can start. The lights in the studio are turned on automatically, and high quality – HD video – is broadcast almost without delay, from both ways.

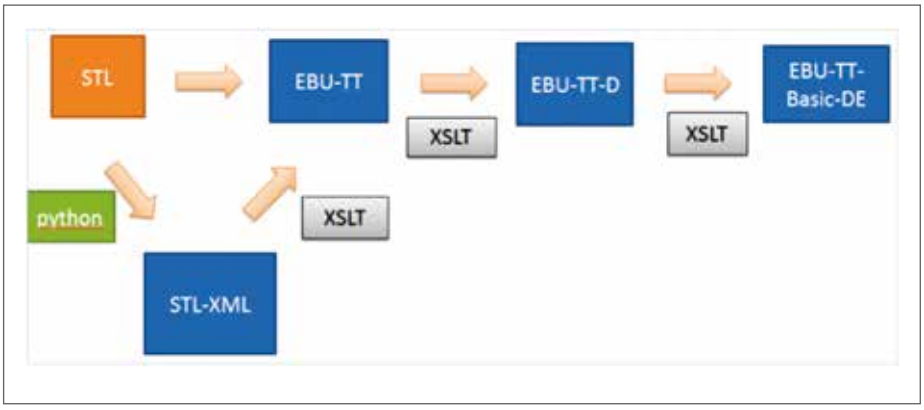
With one of the fastest Internet networks in the world, Lithuania has positioned itself at the forefront of innovation. Therefore, modern and future-oriented enterprisers in Lithuania try to exploit internet-based technologies to their fullest extent. The new solutions and innovations adopted by LRT with Internet-based real time rich communication is setting the standards for merging TV broadcast media in the country.

For more information, see: https://goo.gl/n9zJfB

Making EBU-TT flow

FRANS DE JONG (EBU) INVESTIGATES HOW THE BBC AND IRT ARE WORKING TO GET EBU-TT SUBTITLES INTO THE HOME

To go from innovation to implementation typically requires software to prove concepts, optimize approaches or simply to verify other implementations. Engineers at the BBC and the IRT have independently been working on a common goal: to make EBU-TT subtitles flow to (all) screens at home.



Subtitle Conversion Framework

With the amount of content, the number of distribution platforms and the appetite for subtitling all on the rise, broadcasters face the question of how to optimally organize their subtitles creation process. One important element in the chain from author to play-out is the conversion of subtitle formats.

Triggered by concrete use cases from broadcasters in Germany, Spain and Portugal, the IRT has created a Subtitle Conversion Framework (SCF), which allows traditional EBU STL subtitle files to be transcoded into the new EBU-TT (Tech 3350) exchange format and the EBU-TT-D (Tech 3380) distribution format. There also is a module that allows transforming EBU-TT-D files into the even simpler EBU-TT-Basic-DE, which is used by German broadcasters.

The SCF is largely based on XSLT transformations. The software (currently an alpha release) is available under the Apache 2.0 license, allowing other organizations to use the code in their own products and workflows. For more information, see: https://github.com/Irt-Open-Source/scf

Calling all broadcasters – Project Logo is here!

MATHIAS COINCHON (EBU) TELLS US HOW MEMBERS CAN CREATE AND MAINTAIN INFORMATION ON THEIR STATIONS AND IT IS IMPORTANT DO SHARE THIS NOW.

Are you a radio broadcaster? If so, tune in now because our latest Project Logo is on its way and you won't want to miss out. But what is it, you might ask?

At the Geneva Moto Show this year, we noticed that a number of car manufacturers are hard coding logos into their radio sets. But some logos are wrong or inconsistent when transmission codes change. This leads to many complaints from listeners to broadcasters who have little control over the problem.

Project Logo is an initiative to call on all radio broadcasters in Europe to provide their radio station logos for hybrid radio (RadioDNS). We want car manufacturers to implement hybrid radio in their new models and it's important to have openly distributed and a consistent static metadata database of radio stations to achieve this. By uniting ourselves as EBU Members, we can represent at least 900 radio stations and many more, if we add commercial ones. Other organizations involved include AER for commercial radio station, Radioplayer for countries where this has been implemented, and NAB for the United States.

The first step is to inform broadcasters and find relevant contacts for each organization. Broadcasters can decide to implement the service themselves or they can rely on a service provider. For EBU Member stations, the EBU can act as service provider with a platform that is already set up - the RadioDNS Manager. On this platform, Members are able to create and maintain information for their stations. EBU will provide assistance in creating the entries and also with the RadioDNS registration.

As a minimum, broadcasters will need to provide the following information for each station: logos image, station name, station description, genre, DAB SID/EID (service ID/Ensemble ID) or RDS PI. In addition, they can decide to provide streaming URL (for automatic service following), keywords, web links and geolocation. Throughout the process, broadcasters manage their own entries and can also decide to leave the EBU platform to use their own infrastructure or another service provider at any time.

In technical terms, this is a cloud based infrastructure with a distributed DNS service. The static information lies in an XML file that is served with images using HTTP. DAB operators could also rely on it for digital radio to feed their multiplexers.

If you want to help by already providing this information for your station, please do so by contacting Mathias Coinchon, EBU, at coinchon@ebu.ch.

In the spotlight **Sabine Wahrmann**

IN EACH ISSUE OF TECH-*i* WE ASK A MEMBER OF OUR TECH COMMUNITY TO STEP INTO THE SPOTLIGHT. SAY HELLO TO **SABINE WAHRMANN** (ARD).

WHAT ARE YOUR CURRENT RESPONSIBILITIES AT ARD?
I am currently Head of Programme Data and Interactive Services/ iTV at the ARD Play-Out-Center in Potsdam, Germany. I have an MA degree in Communication Science, Politics and History from the Free University in Berlin. After several years in radio journalism, as reporter and presenter, I moved to the management of digital media production for online and HbbTV.

WHAT DO YOU CONSIDER AS YOUR FINEST ACHIEVEMENT SO FAR IN YOUR CAREER?
I moved out of journalism in order to be part of the internet revolution and have been involved in R&D projects for the broodcasting industry since then. The highlights for me were very early multimedia broadcasting events for radio, TV and online combined with user feedback at ORB (Ostdeutscher Rundfunk Brandenburg). This was years before Google and the so-called web 2.0/social web became huge. We developed an interactive live radio and internet mystery show ("Go, Tommy, go!", Berlin, ORB, 1999 and reported from the Berlin Love Parade for radio and online the same year). Lately, we developed an innovative EPG for ARD that combines linear and non-linear TV.

WHAT ARE YOUR PREDICTIONS FOR BROADCASTING TECHNOLOGY IN THE FUTURE?
As I´m not a technician but a content developer relying on good technology in the field of content management systems, I´ll throw in a few buzzwords: well-linked technology, software tools and software architecture with a modular approach instead of huge and complex systems. And thinking of an ARD context: standardised and valuable metadata in order to have all the excellent ARD content findable for our users.

WHAT, FOR YOU, ARE THE MOST IMPORTANT CHALLENGES FACING EBU MEMBERS TODAY?
Exchanging best practice and agreeing on standards in order to consolidate public radio and TV in a competitive landscape.

TELL US ABOUT SOME OF YOUR INTERESTS AWAY FROM THE WORKPLACE.
For a long time, I have been suffering from a severe mountain madness which some people find odd as I´m originally from Hamburg in Northern Germany. In winter, I spend as much time as possible in the Alps, snowboarding and skiing. The most important thing in my life is my family and my 11-year old son.


DevCon 2015
06-07 October, EBU


Forecast 2015
20-21 October, EBU