MEDIA TECHNOLOGY & INNOVATION

ISSUE 14 • DECEMBER 2012

DASH Delivered

Plus

- IBC 2012 IN PHOTOGRAPHS
- SUPER HI-VISION AT THE OLYMPICS
- DIGITAL RADIO IN GERMANY
- NETWORK NEUTRALITY
- HBBTV UPDATE
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TODA MARKANA M

Today video is everywhere – on every device, website and street corner. But where is Television? Once it was a box. Then a flat screen. Now TV is a service, on the move, on every device and getting connected. The game is changing. At Ericsson we're ready. Are you?

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viewpoint from Lieven Vermaele

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Cover Story: Cover Story: VRT's MPEG-DASH trial used the new adaptive streaming standard to deliver their Sporza service to multiple devices. The app on the tablet is from BuyDRM. Full story page 18/19.

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ith more than 80 EBU Member broadcasters, over 100 private media companies, more than 250 industry and standardization partners, and over 7,000 active accounts on our online platforms, today we are working with, and serving, a community of thousands of professionals in media technology and innovation.

The success of our work cannot be solely attributed to the team at the EBU Technology and Innovation Department. Far from it! It is based on the ideas, contributions, and time spent by the people in that technical community. It is the sum of their and our small and major efforts. It is this collaborative working that makes us efficient and unique.

Over recent years, our successes have been acknowledged across the world via press coverage for the EBU and its Members, the many invitations to speak, and the awards we receive. IBC 2012 was particularly gratifying, with recognition for the FIMS project and our work on LED lights along with a well-deserved award for my former colleague David Wood. These all sustain the EBU and its technical community as a reference point in media technology and innovation. But we must not rest on our laurels.

In a globalized world and industry landscape, we know that scale matters. We can only have an impact when we cooperate. We need to speak with a unified voice on things that matter for our business today and in the future. We need to act, lobby and work on shared concerns and innovations. The EBU is the platform that can make this happen. We must cooperate wherever we can, and only do things individually if absolutely necessary.

Our success is your success

Lieven Vermaele EBU Director of Technology & Innovation

But we also need to think about the future. The number of engineers in broadcasting is not increasing; this will have an impact on our work and what we can achieve in future. Our work is only successful when the broadcasting organizations are themselves successful in their own areas. We will need to work harder in future.

As we close the year 2012, we must resolve to collaborate more in future. This is the way that we will survive and prosper. We need to understand the value of working together in the EBU, and of being able to find common positions on matters that affect us all.

The Technical Committee has established a series of Strategic Programmes that address those areas of most concern for you, the EBU Members. They exist to serve YOU. But they need YOUR participation. It can be as simple as logging on to tech.ebu.ch, clicking on the groups that are relevant for you, and joining them. This will give you access to workspaces and email lists where you can exchange information, develop solutions, join online and offline meetings, and contribute to strengthening the position of you and your fellow public service broadcasters. (And non-members too can contribute, via some of the dedicated projects set up under these Strategic Programmes.)

The more we work together, the more we will gain, and the more cost effective and innovative we will become. Dumas' Three Musketeers were "all for one, and one for all", and were able to vanquish all. We can do the same. Let us make 2013 a year of an even more unified voice and more shared knowledge and experiences.We need you to participate!

DVB PROJECT

DIGITAG

PROF ULRICH REIMERS, WHO STEPPED DOWN AS CHAIR AT THE 100TH MEETING OF THE DVB TECHNICAL MODULE, SPEAKING AT DVB WORLD 2012.



TURNING TWENTY

The DVB Project held its annual General Assembly at the end of October, reviewing twelve months of activities and looking towards new things to come, *writes DVB Director Peter Siebert*. One of the main events in 2012 was Nick Wells (BBC) taking over the chair of the Technical Module from Ulrich Reimers. With his Institute being a DVB member Ulrich will continue to contribute to the progress of DVB technology. Considering his strong involvement in the development of DVB specifications he was awarded Honorary Fellowship of the DVB Project, the highest honour we can provide.

At the GA, our new TM chair provided an outlook on the major subjects DVB will work on in the coming years. The new video coding standard HEVC needs to be integrated into the DVB broadcast specifications. Its improved coding efficiency will also facilitate the transmission of Ultra High Definition TV signals. The higher resolutions to be achieved with UHDTV may also be the enabler for 3DTV without glasses. Another area of interest gaining momentum is companion screen, or second screen. Here DVB is analyzing what kinds of standard are required to combine the main display with any second screen device.

Satellite technology is also going through a new period of development. Performance improvements are still possible and therefore DVB is working on new extensions for DVB-S2 that will improve the performance by about 20%. These topics – HEVC, companion screen, and S2 extensions – will be the key work items for 2013, but not the only ones by any means. There's plenty more to come. At the last World Radiocommunication Conference (WRC-12) it was decided that TV may have to share the 700 MHz band with mobile broadband. If this happens, the terrestrial transmission standards need to be modified to take this scenario into account.

In 2013 we'll celebrate the 20th anniversary of the DVB Project. In these two decades DVB has come a long way; but the job is not yet complete and there remain many activities ahead.

A UNITED FRONT ON BROADCAST SPECTRUM

As reported in *Broadcast Engineering* magazine and elsewhere, at a recent meeting of the Asia-Pacific Broadcasting Union (ABU) Technical Committee, Lieven Vermaele, the EBU's Director of Technology and Innovation, called on the worldwide broadcasting community to unite in defence of broadcast spectrum now and in the future. Vermaele, who is also the President of DigiTAG, proposed that the latter organization could be an ideal forum for such a united effort.

DigiTAG is the only organization where all stakeholders concerned with the network, product and service implementation of digital terrestrial broadcasting can unite. It aims to create momentum around, and raise awareness of the importance of and need for terrestrial broadcasting as a service in Europe and worldwide.

DigiTAG's current membership includes broadcasters, manufacturers, network operators, broadcast regulators and those responsible for frequency spectrum administration. It seeks to align and coordinate the work of these stakeholders through its working groups, which focus on spectrum and market developments, as well as new products and services.

DigiTAG provides the latest industry updates and information on the digital terrestrial television market. It is a platform for stakeholders to meet and agree guidelines on harmonization and implementation of technology. Through DigiTAG these stakeholders can have a common voice with which to safeguard the future of broadcast spectrum. To find out more about joining DigiTAG visit; www.digitag.org.





In the weeks following IBC in Amsterdam, for many in the broadcast engineering community the focus shifted to SMPTE-related activities. SMPTE is the Society of Motion Picture and Television Engineers, an important partner for the EBU's Technology & Innovation department. The EBU hosted the SMPTE Standards Committee meetings in Geneva in September, which were followed in October by the SMPTE Annual Technical Conference in Hollywood, California.

The Geneva meetings brought more than 70 delegates to the EBU headquarters for a series of discussions focused on driving for innovation and new standards in media. Some of the highlights included presentations on LED light measurements (NRK, BBC, EBU), media storage performance evaluations (BBC) and an MXF open source project. Among the most active areas currently are the work on reference monitors based on fixed pixel matrix displays, coordination among the various Timed Text specifications, work on a fingerprint-based mechanism for end-to-end control of audio/video synchronization, and continued studies on higher frame rates.

diary

VIDEO LIBRARY



OF GIRAFFES AND EYEBALLS

The most recent addition to the EBU Technology & Innovation video collection features David Wood on the nature of 3DTV. Part of a growing collection of films where David deals with technical subjects in an accessible way, this latest video explains how stereoscopic 3D images work and why they can sometimes cause some discomfort for the eyes. Visit our YouTube Channel for this and other videos in the "David Wood on..." series. www.youtube.com/ebutechnical



The latter topic was also high on the agenda at October's ATC in Hollywood. The EBU's Hans Hoffmann, who is Vice-President of Engineering for SMPTE, outlined the work that needs to be done to create the standards ecosystem that will enable the rollout of UHDTV. Higher frame rates are a key element in this regard, and still very much open for discussion. But the principle of a 'variable picture rate' was also put forward in a presentation by director Douglas Trumbull. Such a system would have an end-to-end rate of 120 images per second, but a varying number of those could be identical to each other, depending on the content.

One other notable highlight of October's conference was the presentation to David Wood of the SMPTE Progress Medal. The former EBU deputy technical director was given the award in recognition of his career as a scientific and innovative leader in the broadcasting industry, dedicating his life to educating all constituents and proactively seeking a fair consensus for all. Our congratulations to David!



IMPS Network & Learn 10-11 DECEMBER, GENEVA

SEMINAR • 10-11 DEC

Participants at this event will have a chance to reflect on the lessons learned so far from the Integrated Media Production Strategies programme and explore how the findings can be effectively applied in future. Jointly presented by EBU Technology & Innovation and the EUROVISION ACADEMY.

http://tech.ebu.ch/imps2012



Production Technology Seminar 2013 29-31 JANUARY, GENEVA

PTS is the flagship EBU event for the media production community. The theme for 2013 is "Inspired by Users", with a strong emphasis on use cases, practical examples and tutorials. The keynote presentation will come from Disney's VP of Production Technology, Howard Lukk

http://tech.ebu.ch/pts2013



Digital Radio Summit 2013 13 FEBRUARY, GENEVA

Digital Radio Summit

The highlight of the EBU's Radio Week, the Digital Radio Summit brings together key players from Europe's radio community, including all of the main standards bodies, to discuss the latest ideas, trends and challenges around radio platforms and services.

http://tech.ebu.ch/drs2013



BroadThinking 2013 27-28 MARCH, GENEVA

The event where Broadcast meets Broadband, it will be of interest to anyone working with hybrid services, interactivity, second screen, CDNs, IP delivery and everything related to providing media on the internet.

http://tech.ebu.ch/broadthinking2013



Network Technology Seminar 2013 18-19 JUNE, GENEVA

The Media and IT Rendezvous. Bringing together specialists in broadcast engineering and IT networks and infrastructure, whether for production, contribution, B2B, or primary distribution.

http://tech.ebu.ch/nts2013

The presentations given at all EBU Technology & Innovation events are available from our website, often with accompanying videos. Just visit our Event Calendar and click on Past Events.

http://tech.ebu.ch/events

news

QC WORKSHOP



CDN WORKSHOP

MAKING CDNS WORK FOR BROADCASTERS

A one-day workshop at the EBU in October on Content Delivery Networks attracted more than 40 participants. They represented a broad cross-section of broadcasters and other content providers, as well as service, infrastructure and technology providers, all focused on the way delivery networks should develop in future.

From a technical perspective, the focus was on CDN architecture, bringing the Quality of Experience closer to the customer, and how content providers can interface with different CDNs. But the event also examined business aspects, looking at new and old business models. Bram Tullemans, who leads the EBU's work around broadband networks, noted that there were extensive discussions around who should foot the bill for the investments that will be required. He said: "To improve online distribution and deliver a better experience for the audience our content needs to be cached deeper in the network and closer to the end user. CDN technology is indispensible - and any investments that telcos make can ultimately be cost neutral, as the higher network efficiency will offset the upfront costs."

The EBU participates in the European project OCEAN, established to find solutions to the issue of multimedia content clogging up future aggregation networks. Four of the five presenters at the workshop represented the OCEAN project, with the other representing ETSI, the European Telecommunication Standards Institute. His presentation on CDN Interconnection highlighted the proposed solutions for interfaces between different CDNs.

The presentations from the workshop (slides and video) are available from the EBU Technology & Innovation website: tech.ebu. ch/cdn2012



AT OCTOBER'S CDN WORKSHOP: BRAM TULLEMANS (EBU), CHRIS HAWINKEL (ALCATEL-LUCENT), YANNICK LE LOUÉDEC (ORANGE LABS), VINCENT BONNEAU (IDATE), MARCIN PILARSKI (ORANGE LABS), M. OSKAR VAN DEVENTER (TNO).



QUALITY ON THE CARDS

Quality Control is at the top of the agenda for all broadcasters now – but quality means different things to different people. Almost 90 broadcasters, post-production experts and vendors attended the EBU's QC Workshop in early November and spent two days grappling with the topic: what is quality and how best can we ensure that we deliver it? An inspiring keynote from Red Bee's creative director Jane Fielder challenged the preconceptions that many people hold about what defines quality. This creative person talking to a mostly technical audience gave a clear insight into how these two communities can work hand-in-hand.

With file-based production now widespread, the possibilities for automation and the need to define how and where automated processes will either work or not, were top of the agenda.

The EBU's strategic programme on Quality Control will deliver a number of outputs that could change the way the broadcast industry deals with QC. One concrete result shown in 'preview mode' was what looked like a set of playing cards, but with each detailing a specific QC check. Together the cards form a 'periodic table' of QC parameters. They are grouped into audio, video, format and other types of check. Feedback from the workshop participants will help the EBU's QC group add to and refine the cards. An update of the work will be presented at the EBU Production Technology Seminar in January.

Aside from the many insightful discussions and presentations, what was perhaps most valuable about this workshop was the presence of twelve different product vendors, each with a space to showcase their QC solutions. The QC tools landscape has developed very strongly over the past few years, ranging from software that performs very specific 'spot' checks, through to comprehensive solutions that verify many tens of parameters, and on to expert GUIs that help QC staff to quickly check material before it is played out, archived or ingested. Breaking into small groups, attendees spent four hours (!) visiting each vendor individually. This gave everyone involved a really useful opportunity to get to grips with the problems and solutions in a setting that the EBU is uniquely positioned to offer.

case study



SÜDWESTRUNDFUNK'S SEBASTIAN KETT EXPLAINS HOW THE NEW GENERATION OF DIGITAL RADIO IN GERMANY IS FOCUSED ON THE NEEDS OF THE LISTENER.

Radio in a new dimension

ore than a year ago German public and commercial broadcasters alike launched their digital radio services, marking the start of a new era of radio broadcasting. While in the early days of digital radio in Germany, the DAB story was all about better sound quality and technological advantages, today's digital radio story is all about the radio product itself and satisfying the listener's needs.

Satisfaction starts with variety which means: more radio stations are available. Besides the national digital radio multiplex with 13 radio services, ARD is broadcasting more than 60 well-known FM brands in its regional multiplexes and also offers content that is only available on digital radio. As local multiplexes are available in some areas as well, listeners can choose between up to forty radio stations at once. And in contrast to the early days, both commercial and public radio stations are fostering the development.

But it's not only quantity. Digital radio is much more than just a digital audio service. The core of radio is still live programming - but every audio service is accompanied by various additional data services. ARD's public broadcasters have been at the forefront and - as a result of comprehensive media research - published their digital radio product with a "minimal set" of data services. In Stage 1 this minimal set includes live text services such as current title/artist, electronic programme guides with additional information on the radio programmes and schedule data, pictures such as the CD cover/news headlines/traffic and weather charts, and the future mobility service TPEG.

Stage 2 of this content revolution will involve overcoming the old broadcasting principle of "we're broadcasting – you're listening". In that sense local interactivity has already been incorporated into the ordinary DAB slideshow. With Interactive Slideshow – which was showcased in Berlin at Germany's largest trade show for consumer electronics (IFA) in December 2012 – receivers cache transmitted slides in local memory so that listeners can interactively use already received visuals. ARD supports this enhancement and proposed the comprehensive provision of interactive slideshows for its digital radio services by mid-2013. Also ARD is working on further developments such as FileCollector, a.k.a. "podcast via broadcast" or "latest news by one touch".

The long term goal in Stage 3 is full interactivity between the radio station and its listeners. Digital radio critics may argue that this is already a reality via internet radio. But in fact this is not the case. ARD strategically follows a hybrid approach and is, for example, heavily active in delivering the digital radio product via internet radio. But other than audio and title/artist information, the majority of ARD's minimal set services are currently not distributable via this bidirectional channel in a standardized way. And it doesn't look like things will change in the midterm. So the new generation of radio will still be limited to broadcast technologies for the next years.

That doesn't mean that internet is dispensable. But according to the long term goal German public broadcasters will endeavour to enhance broadcasting

with internet technologies to improve the listener experience. For example, since IFA 2012, ARD has been publishing its slideshows and EPG-data for its digital radio brands using RadioDNS. RadioDNS allows receivers to combine additional data (delivered via internet) with audio services (delivered via broadcast). The media experience for the listener is the same as on pure digital radio; but providing identical content via different technologies gives more freedom to the device industry and can help to bring receiver prices down. A good example here is the new radio platform where a reasonable priced audio- and text-only device can be upgraded to a slideshow colour screen radio via a connected smart phone.

Finally it is the cooperation between broadcasters and industry which is one of the major achievements in this new radio era. Finding a common understanding between the needs and requirements of both sides of the chain has resulted in fancy as well as handy devices for much easier radio listening - more than 200 receivers in a wide range of functionality and price illustrate that. And as the network has expanded rapidly, digital radio is already available in 80% of Germany, covering around 90% of the population.

ARD will proceed with its involvement in digital radio development. The new generation of radio is on the rise.

In Brief

- Digital radio is not a technology it's an editorial product (i.e. the combination of digital audio with accompanying data services such as text, visuals and data).
- Digital radio is available in 80% of Germany and for around 90% of the population.
- At the moment more than 220 digital radio sets are available commercially in different price categories.
- Find out more: www.digitalradio.de

event report

IBC 2012: Intensely Busy Community

IBC 2012 COINCIDED WITH THE LAUNCH OF A NEW CORPORATE IDENTITY FOR THE EBU – AND SOME NEW INITIATIVES AROUND OUR PRESENCE AT THIS KEY ANNUAL EVENT. **EOGHAN O'SULLIVAN**, WHO COORDINATED THE EBU'S ACTIVITIES AT IBC, TELLS THE STORY THROUGH WORDS AND IMAGES.

As the crates were sealed up, the loaned demo equipment returned, and the suitcases packed for flights back to Geneva and elsewhere, the EBU team could reflect with quiet satisfaction on a successful event. The many hours of work that went into preparing demos, documents, presentations, conference contributions and meetings all paid off in what was an intense but productive week in Amsterdam for IBC 2012.

Some of the new initiatives for this year included a presentation theatre on the stand featuring regular presentations on a range of current activities; a new series of Technology Fact Sheets describing challenges facing public broadcasters and how the EBU is helping; and a Loudness Breakfast that really tested the dedication of that particular community with an early Monday morning start! Of course there were also, as usual, technology demonstrations on the stand, although we deliberately decided to mount fewer than in previous years. This allowed us to present clear and direct messaging around the demos and provided a more open feel for the stand where visitors could meet and mingle – one of the most important IBC activities.





ABOVE: THE TWO MOST POPULAR DEMOS, REFLECTING THE HOTTEST TOPICS AT IBC GENERALLY THIS YEAR, WERE OUR NEW UHD-1 TEST SEQUENCES, ENCODED WITH HEVC, AND A LIVE MPEG-DASH DEMO THAT MERGED LINEAR CONTENT WITH ON-DEMAND. BOTH DEMOS WERE BUSY FROM MORNING TILL EVENING EACH DAY, WITH VISITORS APPRECIATING THE EBU'S OBJECTIVE VOICE IN THE MIDST OF ALL THE HYPE.

THE FIMS PROJECT HAD ITS WELL-DESERVED MOMENT IN THE SPOTLIGHT AT SUNDAY NIGHT'S AWARDS CEREMONY. TWO YEARS OF HARD WORK LED BY THE EBU AND AMWA, THE ADVANCED MEDIA WORKFLOW ALLIANCE, WERE GIVEN DUE RECOGNITION WITH THE AWARD OF THE IBC JUDGES' PRIZE. FIMS IS ALREADY OPERATIONAL AT BLOOMBERG, WHERE IT'S A KEY ELEMENT IN THEIR IMPLEMENTATION OF A SERVICE ORIENTED ARCHITECTURE. SOME OF THE FIMS PARTNERS WERE PRESENT ON THE EBU STAND WITH DEMOS AND PRESENTATIONS. PICTURED HERE WITH AWARDS IN HAND, FROM LEFT TO RIGHT: ROMAN MACKIEWICZ (BLOOMBERG), BRAD GILMER (AMWA), JEAN-PIERRE EVAIN (EBU), MICHAEL LUMLEY (IBC).











WE WERE DELIGHTED TO ACCEPT AN INVITATION FROM THE IBC CONFERENCE COMMITTEE TO PRODUCE A SESSION ON SATURDAY AFTERNOON. WITH LIEVEN VERMAELE CHAIRING, THE FIRST HOUR DEALT WITH THE MOST PRESSING CONCERNS FOR BROADCASTERS TODAY, WHILE THE SECOND TOOK A LONGER TERM VIEW OF WHAT THE FUTURE HOLDS. PICTURED HERE, IN DISCUSSION AT THE END OF PART ONE, ARE LIEVEN VERMAELE, PASI EKMAN (YLE), KLAUS ILLGNER (IRT) AND MARCO DERGHETTI (SRG SSR). PART TWO FEATURED ANDY QUESTED AND YVES RAIMOND OF THE BBC AND FREDERIK ZILLY OF FRAUNHOFER HHI AND THE MUSCADE PROJECT. IT'S OUR HOPE THAT THIS SESSION CAN BECOME AN ANNUAL FIXTURE – A CHANCE FOR AN IMPORTANT GROUP OF BROADCAST TECHNOLOGY USERS TO MAKE THEIR VOICES HEARD LOUD AND CLEAR.

DAVID WOOD'S CONSIDERABLE CONTRIBUTION TO IBC DOWN THROUGH THE YEARS WAS MARKED WITH A HALF-TIME PRESENTATION DURING THE EBU CONFERENCE SESSION. IBC CEO MICHAEL CRIMP (LEFT) AND COMMITTEE CHAIR DAVID CRAWFORD GAVE CREDIT WHERE CREDIT CERTAINLY DUE.

LED LIGHTS AND LOUDNESS.

BELOW: THE NEW EBU TECHNOLOGY FACT SHEETS PROVED HUGELY POPULAR WITH MORE THAN 5,000 DISTRIBUTED IN TOTAL. AMONG THE MOST POPULAR TOPICS WERE MPEG-DASH, BEYOND HD,



ABOVE: ARGUABLY A "SURPRISE PACKAGE" AT IBC – BUT ENTIRELY DESERVING OF ITS POPULARITY – WAS THE LED LIGHTS DEMO THAT ASSESSED THE PERFORMANCE OF THESE INCREASINGLY POPULAR PRODUCTS. COLORIMETRY EXPERT ALAN ROBERTS AND NRK'S PER BÖHLER WERE KEPT BUSY WITH A CONSTANT STREAM OF VENDORS BRINGING THEIR OWN LIGHTS TO TEST AGAINST THE NEW TELEVISION LIGHTING CONSISTENCY INDEX BEING DEVELOPED BY THE EBU'S LED PROJECT GROUP. NO SURPRISE, THEN, THAT THE DEMO WAS FEATURED ON THE "WHAT CAUGHT MY EYE" SHOW ON IBC TV.





LEFT: ALSO NEW FOR 2012 WAS MONDAY EVENING'S DRINKS RECEPTION ON THE EBU STAND. DESIGNED AS AN OPPORTUNITY FOR EBU MEMBERS AND GROUP PARTICIPANTS TO MEET AND COMPARE NOTES ON THE SHOW, IT WAS A GREAT SUCCESS WITH AT LEAST 150 FAMILIAR FACES IN ATTENDANCE.

THE EBU STAND IS THE CENTRE OF OUR IBC UNIVERSE, BUT WE ALSO REACH OUT TO THE WIDER EXHIBITION. TOURS TO VENDORS ARE ORGANIZED BY SOME OF OUR GROUPS. HERE, FOR EXAMPLE, IS A VISIT TO THE AMBERFISH BOOTH, LED BY THE EBU STRATEGIC PROGRAMME ON QUALITY CONTROL.





(L-R) MORE THAN 70 PEOPLE SAW ORF'S FLORIAN CAMERER CHAIRING MONDAY'S EBU LOUDNESS BREAKFAST, WITH FTV'S MATTHIEU PARMENTIER ON THE PANEL; THE EBU STAND IS A GREAT MEETING POINT, HERE, FOR EXAMPLE, BRINGING TOGETHER EUROVISION CONTACT ENGINEERS AND THE EBU TECHNOLOGY & INNOVATION TEAM; THE PRESENTATION THEATRE WAS OFTEN BUSY, AS HERE FOR ANDREAS TAI'S EBU-TT PRESENTATION; BBC R&D SHOWED NEW RF CAMERA TECHNOLOGY –THEY EVEN HAD T-SHIRTS MADE TO ORDER, HIGHLIGHTING THE BANDWIDTH SAVING MADE POSSIBLE BY USING MIMO TECHNIQUES.

An authentic solution?

AT IBC 2012 THE EBU PRESENTED A PROOF-OF-CONCEPT FOR A POTENTIAL SOLUTION TO THE PROBLEM OF CROSS-PLATFORM USER AUTHENTICATION FOR MEDIA SERVICES. **MATHIAS COINCHON** EXPLAINS HOW IT WORKS.

any broadcasters have begun offering personalized services or creating social media platforms for their audiences, in particular taking advantage of the possibilities of hybrid broadcast/ broadband approaches. This generally means that the listener/viewer has to create an account on the broadcaster website where their personal settings and preferences are stored. This new way of operating represents a small revolution in the usually anonymous broadcast world and it has many legal and technical implications: what information can be stored about the audience? How can it be used? What can be shared with partners? Where is the data stored? For how long? And so on. The legal aspects will need to be addressed, but in this article I'll focus on the technical aspects.

THE CURRENT SITUATION

The first problem that arises in a broadcast context is that the audience is zapping between channels from different broadcasters and so, in theory, one would have to create an account on each broadcaster website. This can quickly become a cumbersome situation for the users as they would need to manage many different logins and repeat the same operation for each personal device. One quick answer is to rely on authentication offered by popular social media platforms such as Facebook or Twitter. This is what some broadcasters are already doing. However, this forces the audience to register on these platforms and, furthermore, it is hard to integrate these platforms into a standard as they are proprietary. There's also uncertainty around their conditions and ability to offer such a service in the future. At the moment no simple solution exists. There's a need for a distributed mechanism where the user can authenticate once and on which broadcasters can rely to store a user's personal data.

THE HYBRID RADIO CASE

One of the interesting features of hybrid radio is the possibility for the listener to 'tag' interesting audio elements for later consultation, more information or to continue listening. People want radio to be simple and so it is important that such a feature is transparent across devices and across channels from different broadcasters.

With this objective in mind, the EBU Technology & Innovation department initiated work on a proof-of-concept for IBC 2012, building on what had been specified by the RadioDNS organization's RadioTAG group. To develop and test the system, which we've named MediaAuth, we worked with Michael Barroco and Tobias Schlatter, graduate students at EPFL, the respected technical university in Lausanne.

Quite quickly, the idea emerged to build a system similar to OpenID, a decentralized authentication system used by Yahoo! and Google, for example, where users can authenticate once on any of these providers to access services on the others. The OAuth 2.0 distributed authorization protocol, as currently standardized by IETF, has been used as the basis. Details (beyond the scope of this article) can be found in the reference document on www.ebulabs.org but the different elements, as illustrated in Figure 1, are:

- the Service Providers (broadcasters), who offer the media services and store the actual data from the user on their specific channels;
- the Authentication Provider, that holds the user's credentials and is responsible for identifying and authenticating users. This can be, for example, a receiver manufacturer portal or could also be the broadcaster;
- a directory, that is responsible for the authorization of Authentication

Providers and Service Providers. It also stores information about which AP is authoritative for a given user.

To keep it short and simple, in such an infrastructure, users login once using their email address and providing a single password. Based on the email address, the directory will divert the service provider to the correct authentication platform to authorize, store or retrieve data for this user. This mechanism offers easy and seamless cross-platform and cross-channel personalization while avoiding the centralization of user credentials and data.

CENTRALIZATION VERSUS COMPLICATION

The proposal is not limited to radio and can be applied to any media service. However, if it were to be widely deployed, it would pose political questions, for example regarding the role of the directory. The necessity for a directory could be avoided but this would complicate the user experience. There are clear trade-offs between a simplified user experience and the centralization of the infrastructure.

In conclusion, we hope that the MediaAuth proof-of-concept will be an initial step towards addressing the problem of media authentication for personalized media services. No standardized solution exists today and it's something that's needed by broadcasters, device manufacturers and, most importantly, users.

For more on the MediaAuth proposal visit: http://www.ebulabs.org



case study

2020 vision at the 2012 Olympics

THE LONDON OLYMPICS WILL BE REMEMBERED NOT ONLY FOR SOME OF THE INCREDIBLE SPORTING FEATS; IT WAS ALSO THE FIRST MAJOR EVENT TO BE COVERED IN UHDTV. DAVID WOOD WAS ONE OF THE LUCKY FEW TO WITNESS THIS TECHNOLOGY FIRST.

ugust 2012 saw some historic coincidences for television. The first was that the ITU-R Recommendation for UHDTV, the next generation of television systems, finally approved by the ITU administrations in August 2012, happened to fall out with the apt number 'Recommendation 2020'. So this is the code number to remember along with '601' for the digital Standard Definition standard, and '709' for HDTV.

At the very moment '2020' was being approved, the London Olympic Games were being used as the most convincing demonstration to date of the practicality of UHDTV. The world was being told 'here now are the common worldwide technical standards for UHDTV, along with clear proof that even the higher level is practical in the near future'.

The ITU UHDTV family has two levels, UHD-1 and UHD-2. The lower UHD-1 (also called Ultra-HD) has pictures with about 8 million pixels, and the upper UHD-2 has pictures of about 33 million pixels. The demonstration at the Games used the more demanding higher level, also called 'Super Hi-Vision'.

GLOBAL COOPERATION

It was organized by Japanese broadcaster NHK (whose Science & Technology Research Laboratories developed the technology for Super Hi-Vision) along with the BBC and the International Olympic Committee's OBS (Olympic Broadcasting Services), with cooperation from NBCUniversal. In all, seven Olympic events were covered in Super Hi-Vision, including the opening and closing ceremonies.

Two temporary UHDTV Outside Broadcast vans were on the road, and either two or three cameras were used at each venue. The images were available live and in edited form via post production from a suite set up at the BBC's Television Centre.

The material was carried to a total of nine viewing centres in three countries, and to the London Olympic Games IBC (International Broadcast Centre). Three of the viewing centres were in the UK – in London, Bradford (where there is a national TV museum) and Glasgow. Three were in Japan, in Fukushima and



at two locations in Tokyo – famous as world capitals of consumer electronics – Shibuya and Akihabara. If people there were impressed, few would not be. The last site was in Washington DC, with a demonstration arranged by the US broadcaster NBCUniversal, for industrialists and government.

ALSO AUDIO

Audio should not be forgotten, and to accompany the ultra sharp images, a 3D audio system, the 22.2 channel system, also developed by NHK's STRL, was used. This allows viewers to locate the direction of sound sources not only laterally (as in today's surround sound) but vertically as well. So when viewing on a very large screen, the user is able to pinpoint the point of emanation of sound over the screen's surface or elsewhere in the room. He or she has pictures with sharpness saturating the capability of the eyes, and is immersed in sound on all sides. It is quite an experience.

The video and audio had to reduced in bit rate in order to be transmitted across London and the world. The transmitted bit rate was 300 Mbit/s. The video coding was H.264/AVC and the audio coding was MPEG-2 Part 7 AAC LC. IP transmission was used.

What were reactions to the demonstrations? For the author, who saw the Super Hi-Vision in London along with EBU Director General, Ingrid Deltenre, the Olympic Games is surely content ideally suited to Super Hi-Vision. Watching the screen and listening to the sound seems effortless, and gave a real sense of immersion, and of being wrapped up in a field of view. You discern more clearly the participants and audience - you even find yourself interested in the faces of the audience. For example, at one point in the Games, a spectator threw a bottle onto the athletics track. We picked this up – who did it and what he did - seemingly well before the TV commentator. This same sense of presence or being there was noted across the world in the demonstrations. UHDTV clearly has 2020 vision.

Look out for an in-depth report on UHDTV at the Olympics in a forthcoming EBU Technical Review paper.

CR – Czech Radio

FOR OUR MEMBER PROFILE IN THIS ISSUE WE TURN TO CZECH RADIO, WITH A REPORT FROM HEAD OF SIGNAL DISTRIBUTION **PAVEL BALÍCEK** AND SENIOR INTERNATIONAL RELATIONS SPECIALIST **MARTIN VEJVODA**.

he Czech Republic was among the first European countries to start regular broadcasting. On 18 May 1923, the former Czechoslovakia began officially broadcasting from a scout tent in the Prague city district of Kbely. Next year Czech Radio will celebrate 90 years of regular broadcasting. Czech Radio and Czech Television are two separate public service entities with two different budgets and managements.

STUDIO HOUSE

After its establishment, Czech Radio quickly gained an audience and the demands regarding its operating facilities increased. In 1933, Czech Radio celebrated the grand opening of its building on Vinohradská Street 12, still our headquarters. In 2000, a new modern structure, Studio House, was added to the existing historic building. Studio House is made up of the broadcasting and recording studios of the main nationwide radio stations: CRo 1, 2 and 3. A substantial area in the basement is occupied by the Czech Radio archives, which document the development of sound reproduction and transmission and radio broadcasting. Our audio archive is one of the world's largest, with approximately 4 million minutes of recordings on various types of media.

Due to the fact that the buildings of Czech Radio are situated in the centre of Prague and in the vicinity of the main railway station, metro lines and railway tunnels run beneath the foundations. The tunnels are buried approximately 10-30 metres under the ground and train services are frequent. This explains the use of so-called Gerb springs, used as vibration and shock dampers, isolating the floors on which the studios are situated.

The construction of Studio House completed the modernization and renovation phase of the studios, all of which took place after 1989. The 1990s saw a transfer from analogue to digital recording. The first steps in the gradual digitization of radio production took place as early as the beginning of the 1990s. This was followed by the modernization and digitization of the production and broadcasting studios in the individual regional offices as well as at headquarters. A computer master control system and the digitization of the archive were also introduced.

DIGITAL BROADCASTING

In 1999, Czech Radio in collaboration with Czech Radio-communications started experimental DAB transmissions. After several subsequent tests, experimental DAB transmissions were discontinued. Stronger emphasis was placed on the digitization of Czech TV broadcasting. In 2002, the first DVB-T broadcasts began, with the multiplex also including Czech Radio services. In cooperation with Czech Television, a public service multiplex was introduced in 2005, with four TV channels and seven radio channels. The DVB-T network covers the entire country.





STUDIO HOUSE WAS OPENED IN 2000; PAVEL BALÍCEK, HEAD OF THE SIGNAL DISTRIBUTION DEPARTMENT

Czech Radio currently offers four nationwide stations: CRo 1 – Radiožurnál (news, current affairs and music), CRo 2 – Praha (entertainment and education), CRo 3 – Vltava (cultural station) and CRo 6 (political analysis and current affairs). The audience can choose from four special digital stations: Rádio Cesko (news and current affairs), CRo D-dur (classical music), Radio Wave (for young listeners) and Leonardo (popular educational programmes). In addition, Czech Radio also operates a network of regional stations. Its international channel CRo 7 – Radio Praha is funded to a large extent by the Ministry of Foreign Affairs and is broadcast in six languages.

Other digital standards have also been tested by Czech Radio. In 2003, tests were run in Prague using the DRM (Digital Radio Mondiale) system, followed in 2005 by a successful test of the DMB (Digital Multimedia Broadcasting) system. The DMB test included video footage of gorillas in Prague Zoo, as featured in Czech Radio's online reality show *The Revealed*.

In October 2006, Czech Radio's international service, CRo 7 – Radio Praha, began digital broadcasting using DRM.

A long time after its first appearance, regular digital radio broadcasting in DAB and DAB+ started on 1 April 2011 (in L-Band multiplexes); it is currently operated by TELEKO and is broadcast to approximately 40% of the population. In 2013 we also expect Band-III multiplexes to start broadcasting.

ARRIVAL OF COMPUTER TECHNOLOGY AND NETWORKS

In the early 1990s, Czech Radio began creating a unified computer network, with all workplaces in the regional and Prague studios gradually connected. Czech Radio's internet presence dates back to November 1994. Our online presence has been continuously expanded, resulting in the establishment of a New Media division. Our extensive online news platform has been available since 2002. At the end of 2011, Czech Radio launched a new version of its online player, the most up-to-date radio player available on the web in the Czech Republic. It enables listeners to switch between live broadcasting and the radio's audio archive containing over 270,000 programmes and other recordings from the past ten years.

in focus

Must Carry Net Neutrality

THE NET NEUTRALITY DEBATE IS NOT A THEORETICAL DISCUSSION ANYMORE, SAYS THE EBU'S BRAM TULLEMANS. THERE IS PROOF THAT TELCOS ARE BLOCKING AND THROTTLING COMPETING SERVICES LIKE VOIP OR MESSAGING. BROADCASTERS' ONLINE SERVICES COULD BE NEXT, AS THEY'RE NOT PROTECTED BY MUST CARRY REGULATIONS IN THIS NEW DISTRIBUTION ENVIRONMENT. NET NEUTRALITY REGULATION WOULD PROHIBIT SUCH A PRACTICE.

he Netherlands is the first European country to enshrine Net Neutrality in law, following only Chile globally. Politicians embraced this approach when network operators revealed that they used deep package inspection (DPI) to differentiate traffic flows. European Commissioner, Neelie Kroes, considers the Dutch decision to be hasty. In May 2012, Kroes decided to prepare a European recommendation to create more effective consumer choice when it comes to Internet offers, but at the same time said that intervention in competitive markets is not on her agenda.

CHOICE OF ACCESS PROVIDER

While the transparency debate concentrated mostly on the information available to end users when choosing an internet provider, in practice it's still very difficult for the user to switch between internet providers. The choice is diminishing, mainly because of the dominant position of the owner of the 'last mile'. More and more small ISPs are overrun by so called 'eyeball' ISPs – providers with a high public profile – who are often also Tier 1 providers, meaning that they actually own parts of the internet's backbone. The fact that internet access is often bundled in Triple Play propositions makes contemplating a migration even more complicated for an end user. It also illustrates the fact that most access providers are also network owners and content aggregators. The ISP solely living from data delivery seems to be a dying breed.

CONFLICT OF INTEREST

It's obvious that there are several conflicting objectives for an organization that tries to sell managed content services, open internet and transit capacity. In recent years broadcasters have made considerable efforts to improve the Quality of Experience (QoE) by arranging private peering with the big ISPs and using CDNs (content delivery networks) to cache content deep into the network, as close as possible to their audience. This was welcomed by the departments of Triple Play operators that sell internet access to end consumers, as it improved the experience. But the content aggregation departments selling, for example IPTV or cable TV subscriptions, seem to consider over the top services on the open internet as cannibalizing. A poor online experience would perhaps lead to users subscribing to more lucrative managed services. At the same time the department responsible for transit turnover isn't happy with private peering because typically they would have earned revenue for carrying the data. It's probably not a coincidence then that some global operators are said to have changed their policy, putting an end to private peering arrangements that push more data into their network than the outbound traffic over that peered line.

TWO-SIDED MARKET

Big eyeball ISPs and telcos are pushing for a two-sided market where money can be earned not only from end users renting access to the open internet, but also from the content providers who want to reach that audience. From a broadcast perspective this is a strange development. Rather than paying for carriage, PSMs should demand payment from the telcos for the content they are sending into the network. The

"...the question arises as to why an ISP would invest in resolving congestion on those traffic flows..."

value of this content is among the main drivers of broadband take-up in the first place. Perhaps then it would be understood that private peering arrangements are not that bad after all. Furthermore the two-sided market risks creating a situation where investments are not spent in improving data flows over the open internet in general, but are instead concentrated on the data of companies that can and will pay to reach their audience. Other content providers would be relegated to Internet Exchange points and the question arises as to why an eyeball ISP would invest in resolving congestion on those traffic flows? In the end they can create a bigger turnover when both consumers and content providers are forced to use optimized and managed services.

MUST CARRY ON THE NET?

Net Neutrality regulation on a European and national level could prohibit blocking and throttling of online services, when combined with transparency on the sustained bandwidth delivered by an access provider to the national Internet Exchange point or backbone of the internet. It should be clear and demonstrable what is offered as open internet access, and managed services shouldn't be part of that particular equation. In that situation it would make sense for an eyeball ISP to optimize all data flows and not just some. Public broadcasters are required to reach the whole population and 'must carry' regulation aims to enforce that task in a competitive distribution market. Net Neutrality combined with the right level of transparency could de facto act as such a safeguard for all content on the open and free internet. But transparency and net neutrality regulation will only suppress the conflict within the consolidated operators. The only real solution would be functional separation. Connectivity providers should not be allowed to offer services and vice versa. But that option is considered theoretical again.



WHAT IS NET NEUTRALITY?

One definition of Net Neutrality that is gaining in influence is that of Columbia University professor Tim Wu: "Network neutrality is best defined as a network design principle. The idea is that a maximally useful public information network aspires to treat all content, sites, and platforms equally." The presupposed role of a network owner is delivering infrastructure and the access to it without differentiating between data flows. Problems arise when congestion creates traffic jams that block all data. In that situation certain traffic management rules are generally accepted. To learn more about the EBU and Net Neutrality contact tullemans@ebu.ch.





THE EUROVISION EXCHANGE NEWSROOM IN GENEVA.

FROM ITS LAUNCH ON 1 JANUARY 1962, THROUGH 9/11 AND RIGHT UP TO SUPERSTORM SANDY, THE EUROVISION NEWS EXCHANGE HAS BEEN INSTRUMENTAL IN BRINGING INTERNATIONAL NEWS TO EUROPEAN SCREENS QUICKLY AND EFFICIENTLY. WITH NEW TECHNOLOGIES COME NEW POSSIBILITIES, EXPLAINS **SAM DUBBERLEY**, HEAD OF NEWS EXCHANGE.

Change at the Exchange

n 1958 five broadcasters – among them RAI and the BBC covering the death of Pope Pius XII – began tentative trials in exchanging news footage. Since then the News Exchange has grown year on year, both in terms of variety and the volume of material exchanged. In 1962 just 1,106 items were exchanged. By 2011, that had grown to 49,144 individual edited items and more than 2,800 hours of live transmissions.

The EUROVISION News Exchange exists for EBU Members, but participation goes beyond that: sister unions and selected sublicence holders also take part. By joining the Exchange, EBU Members agree to share coverage that they generate - domestically and increasingly internationally - to enrich the bulletins of their fellow Members. EBU sister unions, the Arab States Broadcasting Union (ASBU) and the Asia-Pacific Broadcasting Union (ABU), through its news service Asiavision, as well as certain sublicence holders commit to do the same. This professional solidarity strengthens public service media through providing access to material not available to commercial competitors at home.

TECHNICAL EVOLUTION

In the past fifty years, the News Exchange has, like the rest of the broadcast industry, evolved and adapted to implement new technologies. In 1964, J.W. Rengelink of what is now NOS, then chairman of the EBU News Study Group, wrote that "technical links with other parts of the world will make possible faster distribution of news". The accuracy of this prediction was reflected in the evolution of the EUROVISION news network via satellite; and today his statement has proved more accurate than ever. The only difference is that the technical challenges have become greater and the speeds faster.

Advances in file transfers via the internet have driven a rapid expansion in scope for the News Exchange. It now brings in regular content from Asia, Australasia and the Americas, previously too expensive or time consuming. This technology resulted in the News Exchange making, through Japan's public broadcaster NHK, more than 72 hours of uninterrupted live coverage and many more edited pieces available to its Members following the devastating earthquake and tsunami that hit Japan on 11 March 2011. And these very technologies will form the backbone of the News Exchange as EUROVISION moves towards completion of the Transition-to-File (TtF) project.

THE IMPACT OF TtF

Launched in September 2010, TtF will adapt the News Exchange to modern integrated multi-platform newsrooms. Its goal is to move the exchange of edited content away from the linear fibre and satellite-based exchange that has served for half a century, to a predominantly filebased exchange.

The project reached a milestone last September with the unveiling of the new platform that will come into service in 2013. The TtF project combines this new contribution and distribution service with a full renewal of the main News Exchange newsroom in Geneva. The result will be a smarter, more modern service with easier integration at Member facilities.

Other key benefits of TtF include remote access to News Exchange content, which is useful for journalists working away from their main office. And Ttf will create a service to facilitate the exchange of content between EBU Members without intervention from Geneva, through an online platform called M2M.

Another first comes in the watermarking of all edited and most live content exchanged. This will enable us to report back to Members both on the value they derive from the content taken, as well as how widely their own material is used.

ORGANIZATIONAL INTEGRATION

The changes are not limited to the technical domain. On 1 September 2012 the News unit officially became part of the newly formed Media Department, led by Director Annika Nyberg Frankenhaeuser. This has logically led to the integration of television news and radio news within EUROVISION.

First steps towards this were taken in earnest at a meeting last September at ORF in Vienna, with the inaugural joint meeting of the Radio News Group and the Television News Committee. This integration is expected to lead to a more robust Radio News Exchange as well as more cross-platform editorial depth in both daily activities and professional forums.

It is well known that technology has fundamentally changed news-gathering and reporting in the past fifty years. Today footage can come from anyone in the street with a smartphone, and the use broadcasters make of this new world of 'citizen journalism' is the subject of fervent industry debate. In this context the EUROVISION News Exchange is adapting and evolving to ensure that the public service broadcasters can bring news to their audiences anywhere, anytime, and on any platform.

Is Hybrid TV mainstream?

PETER MACAVOCK, THE EBU'S HEAD OF MEDIA DELIVERY AND SERVICES, TAKES A LOOK AT THE STATE OF HYBRID TV ACROSS EUROPE.

ybrid TV has come of age but is it mainstream? Let's see. Services are on air in various countries around Europe; most large-screen TV sets are connectable to the internet; and they now incorporate the standardized Hybrid TV systems. A rising proportion of these sets are actually connected to the internet in viewers' homes. So the ingredients are there.

Many broadcasters have worked for years in interactive TV. MHEG-5 freeto-air informational services started in the UK in 1998. MHP by DVB was finalized in 2000, and remains popular in Italy. Further, its close relative GEM is the basis for interactive services in US cable networks and in Blu-ray players. Add to this the fact that broadcasters have the most popular domestic online brands in their respective markets. More recently, HbbTV has become the hybrid TV system of choice in Germany, France, Spain and the Netherlands. Broadcasters have extensive services on air over cable, satellite and terrestrial networks.

THE DRIVERS

So let's look at some of the drivers for hybrid TV services at launch. In the analogue era, teletext services were seen as a crucial revenue stream in some markets and essential in most. Transferring this appeal to the digital era was seen as key, especially after analogue switch-off, but they need to compete with online media.

Many broadcasters were surprised by the success of their online services, and particularly catch-up TV. Available over the internet, originally to computers, it offered consumers the powerful proposition of being able to watch programmes they might have missed. What we have noted is that this has eaten into the popularity of personal video recorders (PVRs), probably due to the simplicity of the proposition. Bringing this catch-up experience to the consumer electronics world is seen as a key driver for hybrid TV.

THE CHALLENGES

But there are some challenges. As you move from computer screens to TV screens, the picture quality demanded by the viewer increases. There are two reasons for this. The first is the difference in screen size and viewing difference, for which a balance needs to be struck.



The second is the need to avoid an annoying difference in quality between the main linear channel and its catch-up equivalent. As such catch-up services are delivered over internet networks, there is a significant impact on capacity requirements. Figures vary, but at its peak, BBC's iPlayer alone consumes between 10-15% of internet bandwidth in the UK!

Imagine a future when broadcasters bind their linear and catch-up services into a single backwards EPG proposition. Doing this will doubtless place further demands on internet networks. And this is where the discussions about network neutrality are so important to resolve quickly. This topic is covered elsewhere in this issue of tech-*i*. (See p.13)

Along with infrastructure concerns there is the challenge of turning hybrid TV into a profitable enterprise. Teletext generated revenue, and one could imagine that digital informational services available on hybrid devices could do the same. Will catch-up TV be able to generate the revenues to cover its costs? This is not clear at this point and will be a particular concern for commercial broadcasters.

CONTENT IS KEY

On the basis that it's all about content, there's a case to be made for simplifying access to the content. This is where the broadcaster proposition is particularly strong. One can understand the vendor's wish, through so-called 'SmartTV' portals, to bring the online brands such as Skype, that typically don't appear on a TV set, to the consumer. Time will tell whether these are popular enough to justify the expense in developing and promoting these specific solutions. In the meantime, there's room for both approaches.

So Hybrid TV is becoming more and more popular, with services coming on air in Poland, Czech Republic, Switzerland, Turkey, and others. The cornerstones of these offerings will be information services and catch-up TV. This is just the start, but retaining the simplicity of proposition throughout is essential.

WHAT'S NEXT?

A new version of the HbbTV specification is in preparation. New features will help bring additional services to HbbTV portals. A key step along the way is the finalization of HbbTV 1.5 – published by ETSI recently as TS 102 796 V1.2.1. This new version contains support for MPEG-DASH – a key technique to aid internet distribution of media, with its harmonized file format and adaptive streaming capabilities. (See p.18)

So the future for Hybrid TV is certainly bright. Making it mainstream will require it to address the challenges of reliable infrastructure and revenue generation. What is clear is that broadcasters everywhere need to address the opportunity by offering Hybrid TV services to the connected TV market.

Making Networks Work Well

THE TRANSITION TO IT NETWORKS AND INFRASTRUCTURE FOR BROADCAST PRODUCTION IS NOW INEVITABLE. THE EBU'S FUTURE NETWORKS AND STORAGE SYSTEMS (FNS) GROUP IS HELPING TO HARMONIZE THIS CONVERGENCE OF TECHNOLOGIES AND TO GUIDE ITS MEMBERS THROUGH THIS CHALLENGING PERIOD. FNS COORDINATOR **FÉLIX POULIN** (EBU) TALKS WITH CHAIR **MARKUS BERG** (IRT) AND VICE-CHAIR **LARS JONSSON** (SWEDISH RADIO).

FÉLIX: Why the need for a Strategic Programme (SP) on networks and storage? MARKUS: It's clear that media production is in deep transformation, from tape-based to file-based workflow; from black-box to Service Oriented Architecture; from SD to HD, 3DTV and eventually UHD; from linear to object storytelling; from dedicated output format to tri-media support; and so on. To support and enable these evolutions, the underlying infrastructure is migrating from specialized - and sometimes proprietary - electronic systems to IT commodity equipment and IP based protocols. Crucially, IP networks are now available at ever-increasing bit rates. (See graph)

LARS: Nevertheless we shouldn't forget that IP/IT was primarily designed for email, web, database and other business applications. So it is error tolerant, fundamentally best effort, adaptive to available bandwidth and routable. Generic storage systems are often optimized for a huge number of small files. On the other hand, broadcasters are used to time accuracy, dedicated and reserved bandwidth, predictable performance, big files, sustained high bitrates, high availability on dedicated hardware, and rather simple point-to-point one-way links. **FÉLIX:** So, what are the most urgent challenges for EBU Members dealing with this transition?

MARKUS: Firstly, there's a problem of interoperability and vendor lock-in because of a lack of open standards. Secondly, we all try to reproduce the characteristics of broadcast infrastructure using generic IT components and IP networks. And thirdly, in terms of challenges, there is a general need for mutual understanding, a common vocabulary and sharing of knowledge between broadcast engineers and IT experts within the organizations themselves.

FÉLIX: If they are the challenges, what is the FNS programme doing to help? **LARS:** We're addressing the need for interoperability of next generation 'media over IP' technologies, which are replacing the legacy dedicated methods, via a number of activities. One of our projects, ACIP, is about Audio Contribution over IP, a replacement for ISDN. It has published a well known recommendation, Tech



THE GRAPH SHOWS THE EVOLUTION OVER TIME OF AVAILABLE BANDWIDTHS. THERE IS A CONTINUOUS INCREASE IN THE ACTUAL BIT RATES OVER ALL IP NETWORKS AT A MORE OR LESS UNCHANGED PRICE. COURTESY KEVIN GROSS (2011). THE FUTURE OF HIGH-PERFORMANCE MEDIA NETWORKING. *AES 44TH INTERNATIONAL CONFERENCE: AUDIO NETWORKING*. NEW YORK: AUDIO ENGINEERING SOCIETY.

FIND OUT MORE AND JOIN OUR ACTIVITIES FNS and related projects: http://tech.ebu.ch/fns Open Expert Community: http://tech.ebu.ch/ecn Recent Event: Cloud Workshop http://tech.ebu.ch/cloudworkshop Upcoming event: NTS 2013: Reserve 18-19 June 2013: http://tech.ebu.ch/nts2013

3326, that is implemented by more than 15 manufacturers. It's now expanding applications to uncompressed multichannel synchronous audio over IP for production purposes. For this we're liaising with the AES X.192 standardization effort.

Another project, I3P, has developed a recommendation for Interoperability of Intercom over IP, Tech 3347. We recently conducted a successful plug test that was helpful to clarify and fine-tune the recommendation. And the VCIP project is doing the same for Video Contribution over IP, recommending what standards to use and how.

MARKUS: Turning to the challenge of adapting IT to media applications, the FSS (Future Storage Systems) project will provide guidelines on how to evaluate storage needs and select appropriate systems. We're also investigating how to negotiate a Service Level Agreement that's specific for media-transport services between a media organization and a

network service provider: the SLA project will provide a common vocabulary and guidelines for this purpose. (See tech-i 13. LARS: Markus also mentioned the need for mutual understanding. Because EBU Members must adapt quickly to this changing sector, they need to pool their resources and share their solutions. The EBU is playing the central role of providing a professional network within the Membership and with the industry. Our Network Technology Seminar (every June) is THE yearly happening for every media infrastructure expert. Our November 2012 Cloud Workshop addressed what broadcasters should know before considering Cloud solutions. And finally we have ECN, our open expert community on Network and Infrastructure issues with a quarterly newsletter about the activities of FNS.

FÉLIX: Well, we can see that FNS is working hard to address the current needs of the Members. Thanks Markus and Lars!

strategic outlook



DAVID WOOD EXAMINES THE DILEMMAS THAT BROADCASTERS CAN FACE TODAY AROUND STANDARDIZED SYSTEMS VERSUS PROPRIETARY OPTIONS.

The Standards Strike Back

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In the early 1980s, the next transition was to a digital video recorder, and this time the broadcasters themselves intervened in preparing a common standard, in the EBU MAGNUM group. It brought together both broadcasters and manufacturers in the same group. This looked like the next step to an open market for programme making equipment. Wonderful?

ENTER THE D-1

The result was the D-1 video tape recorder, which goes on record as the VTR with the smallest sales up until then - or since. What happened was that, in order to get everyone to agree on a common standard, everyone's – and I mean everyone's – requirements were included. The D-1 was large and extremely complex. It was not a practical piece of day-to-day production equipment. Different manufacturers then developed their own recorders (and more practical standards) and these sold well.

Sometimes common open standards can work out for the best, and sometimes not.

THE D-1 VIDEO TAPE RECORDER – COVERED **EVERYONE'S** REQUIREMENTS!

The lesson of D-1 was arguably that equipment standards need to be designed so that the eventual



product can be commercially successful. Projects like DVB now start the standards development process with the question 'what does this need to do and cost to be commercially successful?'. The success record of the DVB Project has been high in home delivery systems.

Would broadcasters in the current decade be able, and bold enough, to agree not to buy or use new production systems until they were a single open standard? It would be difficult, because there are many more broadcasters around today – there are over 8,000 television channels in Europe now. And, rather than technology experts, purchase decisions can be made by production staff who, some would argue, can have the tendency to think in the short term rather than strategically.

There is also an example of the 'buy now or wait' dilemma in satellite operations today. There are those who argue that rather than use an already available proprietary system as a successor to the DVB-S2 satellite contribution format, we should wait for a new common open standard. Against this is the bit rate gain of using a proprietary system today.

A MODERN DILEMMA

A related issue, which is to some extent a modern equivalent of that dilemma, is whether broadcasters today recognise that asking for customization in equipment or software, compared to the off-theshelf form, may have disadvantages? If the software is not the standard package, you may be effectively doing the 'beta test' for it. It may take time, energy, and money to get it to work perfectly. Beta testing means giving the system the experience of many signal and temporal conditions to find out where and when a software system will not work as you wish. If you change software significantly, and there are only a small number of customers for it, this beta testing can be a natural need.

At a recent meeting of the EBU Broadcast Technology Futures Group the plea was made for broadcasters to think twice about asking for their own variations of equipment and software. Other examples cited included hybrid broadcasting, where national variations may be emerging. Klaus Illgner, who works with Europe's German-speaking broadcasters at the IRT, pointed out that, with the greatest respect to manufacturers, unless we stop fragmentation among broadcasters' choices, we are "just making ourselves poorer and the manufacturers richer". Do you agree?

The issue is therefore the extent to which broadcasters can or should act together in their choice of standards and software, and to what extent short term commercial gain needs to override potential longer term commercial gain. Unfortunately no Yoda we have, to us help.

An Olympian effort: the first public DASH trial

THE FIRST PUBLIC TRIAL OF MPEG-DASH BY BELGIAN PUBLIC BROADCASTER VRT, DURING THE LONDON OLYMPICS, WAS AN IMPORTANT STEP TOWARDS THE COMMERCIALIZATION OF THE STREAMING STANDARD. **STEFAAN CLYCQ**, WHO COORDINATED THE TRIAL ON BEHALF OF VRT, EXPLAINS HOW IT ALL WAS SET IN MOTION AND WHAT COMES NEXT. INTERVIEW BY **EVELIEN VAN MALDEREN**, COMMUNICATION OFFICER AT VRT RESEARCH & INNOVATION.

WHEN DID THE MPEG-DASH TRACK TAKE OFF?

Back in April the EBU launched an open call for participation in a project to create a live MPEG-DASH service during the London Olympic Games. A number of industry partners from the DASH Industry Forum (then called the DASH Promoters Group) had already been gathered to deliver the necessary infrastructure. At VRT we were immediately motivated to join the project.

WHAT MAKES IT SUCH AN EXCITING CASE FOR VRT?

These days there is a great diversity of operating systems, and we lack a common denominator that enables video streaming on these different platforms. As a public broadcaster we are challenged with trying to reach the maximum number of media users, without compromising the quality of user experience. An optimized streaming experience is key in meeting both of these requirements. Therefore, we were very eager to participate, as MPEG-DASH has the potential to become the denominator we are looking for. MPEG-DASH, moreover, makes digital rights management possible, which is a great advantage when it comes to streaming sporting events.

WHO ELSE PARTICIPATED IN THE TRIAL?

VRT was the only broadcaster involved, though the trial was supported by a number of DASH Industry Forum members. Encoding was provided by Elemental, Harmonic Inc. and Media Excel; the streaming origins were courtesy of Wowza and CodeShop, who also provided encryption. Web clients for PC and Android were supplied by Adobe, and BuyDRM provided applications for iOS and Android incorporating its DRM solution. Belgacom, finally, put in a great effort in delivering the streaming infrastructure.



HOW WAS THE EXPERIENCE OF WORKING TOGETHER WITH THESE PARTNERS?

I can look back on a positive and constructive collaboration. There was everything aside from a competitive vibe, despite the fact that some participants are generally competitors. On a weekly basis we organized a conference call in order to keep everyone informed and make further arrangements. While all of the gear was installed in our buildings, still all manufacturers could tune the equipment from their own offices.

WHAT DID YOU PICK UP FROM THE TRIAL?

MPEG-DASH has a lot of potential to break through in the near future. It is, therefore, important to continue our research and trials. The development of players that work on all devices is key for the success of MPEG-DASH.

HOW WAS THE TRIAL RECEIVED?

We had a very encouraging response from the industry, with new companies showing an interest in joining the project. Also there were many media reports on the trial around the world, mostly in technical publications. It was, furthermore, a pleasant surprise to find out that our trial was cited on the website of Neelie Kroes, vice-president of the European Commission. The trial definitely did not go unnoticed, which makes us at VRT very proud to be involved from the start – it is certainly a motivation to keep going.

IS VRT PARTICIPATING IN MORE MPEG-DASH DEMONSTRATIONS?

Following to the Olympics trial we were part of a demo for the EBU stand during IBC in Amsterdam. There we provided a live stream of the VRT's channel *één*. In November a trial will be organized for the EBU's Strategic Programme on Broadband Networks (BBN).

TECHNICAL DETAILS

The proof-of-concept featured a live video stream of VRT's sports brand *Sporza* encoded using the MPEG-DASH ISO Base Media File Format Live Profile, delivered through Belgacom's Content Delivery Network to a range of device categories. The demonstration was based on an early version of the DASH-264 interoperability guidelines. The video delivered consisted of six

The video delivered consisted of six different streams that could be chosen

In the spotlight



by the player to adapt the video playout automatically to the available bandwidth. The highest quality was 1,500 kbps for the video, and there was also an audio-only stream available for when the internet speed was inadequate for video. The settings of the various adaptive switchable streams in this proof-of-concept were not defined for optimal audiovisual quality. Simplicity was the key driver in selecting the Baseline profile for H.264 encoding and a 64 kbps audio bit rate limitation. This ensured that switching between the different streams ran smoothly.

The video codec used was H.264 Baseline (ABR), while for audio the demo used AAC LC (SBR). A time-based template was used. The freely available Android app switched seamlessly with an interval of a few seconds between an open and DRM-restricted feed, proving that the rights management technology could be used without affecting the end user's experience.

You can find a more detailed introduction to MPEG-DASH in issue 12 of tech-i, on page 6.

EBU Members can follow and/or contribute to the EBU's DASH-related work by joining the Strategic Programme on Broadband Networks. Visit: http://tech.ebu.ch/bbn



A FORUM IS BORN

Due to the large interest in the DASH Promoters Group a further formalization of the initiative was proposed. Therefore the group has transformed into the **DASH Industry Forum**, an organization that promotes market adoption of the MPEG-DASH standard. The EBU is a contributing member. One of the activities within the DASH IF is the definition of DASH-264 as a general interoperability framework aligned with the HbbTV 1.5 specification and the recommendations of other consortiums.



WHAT ARE YOUR CURRENT RESPONSIBILITIES AT THE BBC?

I am Head of External Relations for BBC Research & Development. In my role, I am responsible for developing, overseeing and managing all the collaboration and partnership activities that we undertake. This covers a wide spectrum of collaborative projects funded by the European Commission and UK agencies; research partnerships with key academic institutions and industry organizations; and our standardization activities, such as within DVB, ETSI, SMPTE, W3C etc...

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

I think it has to be leading the talented BBC R&D team that was responsible for the technical architecture and systems development behind the launch of BBC digital TV services on terrestrial, satellite and cable platforms in the UK, in the late 1990s and up until 2006. They were exciting times, with many challenges to overcome in order to hit aggressive launch dates and then evolve the platforms so as to provide our UK audiences with an attractive proposition for digital TV.

WHY DID YOU STEP FORWARD AS A CANDIDATE FOR THE EBU TECHNICAL COMMITTEE?

I am passionate about public service broadcasting. For most nations it is a core cultural medium, bringing people together for cultural and sporting events – such as we have recently seen in the UK with the Olympics – as well as providing everyday entertainment, news

(Editor's note: Just before going to print we arranged for Andy and his Technical Committee colleagues to visit CERN, so that's another ambition achieved!)

Andy Bower BBC

BBC

STEPPING INTO THE SPOTLIGHT FOR THIS ISSUE OF TECH-/ IS EBU TECHNICAL COMMITTEE VICE-CHAIR ANDY BOWER.

and information. Technology has a big and increasingly important role to play in that process. Through the Technical Committee I feel I can help contribute to that.

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

Making sure that broadcasters are prepared and able to evolve their end-toend service propositions to fully benefit from the development and application of new technologies. We are already in the digital era, but we need to embrace and exploit its opportunities, such as IP production and delivery, so that we stay relevant to our audiences and can offer them compelling content and functionality.

That's not to say broadcast is by any means 'dead'; indeed we need make sure that we retain sufficient capability and resource, such as spectrum, to continue to service our audiences.

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

I am heavily into listening to all sorts of music – everything from progressive rock to classical – with an extensive collection of music on a variety of formats from vinyl to CD to digital files. I enjoying cycling for fun – but I am no Bradley Wiggins! My doctorate is in cosmic ray astrophysics so I like to keep across developments in astronomy and particle physics. I am still hoping one day to pay a visit to CERN and the Large Hadron Collider when I am in Geneva!



MEDIA TECHNOLOGY & INNOVATION EVENTS IN 2013



PRODUCTION TECHNOLOGY SEMINAR 2013 INSPIRED BY USERS

29-31 January

The EBU's flagship production technology event where the emphasis is on use cases, practical examples and tutorials.



DIGITAL RADIO SUMMIT 2013 Part of EBU RADIO WEEK 13 February

At the heart of Radio Week, the Digital Radio Summit highlights the latest ideas, trends and challenges around radio platforms and services.



BROADTHINKING 2013

WHERE BROADCAST MEETS BROADBAND 27-28 March

For anyone interested in hybrid services, interactivity, second screen, CDNs, IP delivery and bringing media to the internet.



NETWORK TECHNOLOGY SEMINAR 2013 THE MEDIA & IT RENDEZVOUS

18-19 June

Aimed at IT network and storage specialists that deal with broadcast media content and broadcast engineers working with specialized and IT infrastructure.

Information & Registration: tech.ebu.ch/events