



in Focus

By David Hodges (Chair, SCTE Technical Committee) and Dr. Peter Siebert (Executive Director, DVB)

A review of the recent Digital Video Broadcast (DVB) World conference in Warsaw, where SCTE sent two bursary winners from IPKO.

Once a year, the broadcast community comes together at the DVB World conference to discuss the industry's latest developments and future trends. This year's event took place from **12-14 March 2018** in the Polish capital, Warsaw. The three-day conference was well attended with participants from around Europe as well as from Africa, Asia and North America.

DVB World is the only annual event specifically dedicated to digital media technologies and services built on DVB specifications. It is also a key industry event to meet old colleagues and engage

with new contacts. The coffee breaks, together with the evening events, offer plenty of opportunities to discuss the latest news and to exchange opinions and views. The SCTE was at DVB World and also sent two lucky bursary winners from Kosovan network operator, IPKO Telecommunications, to the event. Their report can be found below.

SCTE bursary winners

SCTE's two selected bursary winners, from cable operator IPKO in Kosovo, commented on their experiences at DVB World.



Above: The two IPKO bursary winners at DVB World, who were invited onto the stage on the first day of the conference



Edmond Vërbovci
Team Leader
Telework Installation, IPKO

This year was the first time that I had attended DVB World. The exhibition and conference overall were beyond my expectations! The event celebrated 25 years of the DVB, and had three main themes: What is key in the industry today? What is DVB doing to deliver these? What are the technology requirements of the future?

I noticed a common thread in the conference, among the themes, which highlighted how good the DVB has been at producing standards for the delivery of technology from a physical layer point of view, but this work can only achieve so much. DVB needs to change and adapt the way it works to remain relevant and take into account the bigger picture of a complicated market with many interoperability considerations.

Peter MacAvock (EBU and DVB Chairman) suggested that DVB could pilot new ways of working on standards, which could be less focused around closed working groups and have more emphasis on open source and community participation. Professor Ulrich Reimers, from the Technical University Braunschweig, suggested that DVB needs to take more account of media delivery concepts being

SCTE Bursary
WINNER



developed in 3GPP as part of LTE and 5G. We have also passed this suggestion to our supervisors and units with the same interest.

There was discussion about the next generation of distribution, looking at 5G for broadcast and the enhancements for eMBMS as well as a new DVB standard being developed called DVB-I (I stands for Internet) as well as work on WiB and whether it is the next DVB-T solution. The overarching principle was to help the broadcaster and content providers offer the best solution to the user, depending upon the scenario.

The conference examined some of the next developments for media delivery, providing improved user experiences through high frame rates for UHD, next generation audio, Augmented Reality and Virtual Reality.

My thanks to the organiser of the event, staff at the InterContinental Hotel in Warsaw and the SCTE, who kindly enabled us to attend DVB World 2018 and visit the city of Warsaw.



Orhan Hoxha
Fibre Optic Team Leader, IPKO

This year's DVB World 2018 conference was a very positive experience for me.

This is the first time that I had attended DVB World and I was amazed by the people as well as the technology that has been developed over the years and was presented on the 25th anniversary of DVB. I particularly enjoyed the Masterclass, where the delivery of content on multiple devices and the everyday increases in demand for content from users was highlighted. I also found the presentation entitled "A Landscape of Polish TV" very absorbing, as well

as presentations on advertising market strategy.

Meetings and discussions with people and engineers from different fields were very interesting and also very helpful for me for knowledge-sharing inside the company where I work. It was also helpful to chat with exhibitors at the event.

I must thank the SCTE and DVB for giving me the opportunity to attend this conference and helping me to develop my career as a telecommunication engineer.

SCTE Bursary
WINNER





Above: Scenes from DVB World 2018

An introduction to DVB

The reception area contained a refreshment section, including food and a small exhibition with stands from some of the DVB supporters. Sessions/presentations given were wide-ranging, covering most aspects and platforms of European television. The conference room was arranged with small desks for all delegates, each equipped with electrical supplies for laptops and a good Wi-Fi system for internet access. This connection allowed delegates to raise questions, discussion points or observations as the conference progressed. These were presented towards the end of each session and were open to the floor for debate.

The introduction to the conference started with an explanation of the SCTE's policy of granting bursaries to members who would not normally have access to such events, explaining that it had two bursary winners present for the conference. They were called up to the stage and introduced to everyone. We then moved on to past achievements of the DVB, noting that one-billion TV receivers worldwide were now equipped with DVB.

So far, the main DVB Standards relate to terrestrial TV T1 and T2, Satellite TV, S1 and S2 and Cable TV, C1 and C2 and, considering these on the physical layer, there are also other developments in Wi-Fi, ADSL, 3GPP and DOCSIS 3.1. For DVB to continue, DVB-I and DVB-TA are important new developments, but DVB also needs to work with 3GPP, HbbTV and W3C. Given that this year is the 25th anniversary of DVB, we were given a brief history of how it all started and developed.

The conference in focus

The three-day conference programme covered all aspects of digital television. Traditionally, the first day starts with a masterclass on a current broadcast industry technology topic. This year, Martin Schmalohr from IRT (the research institute of the German, Swiss and Austrian public broadcasters) provided an interesting lecture on IP transmission of AV content. The audience learned about the various technologies and took a deep dive into the details of OTT delivery via DASH.



Above: The conference room at DVB World (photo by Dave Hodges)

During the second half of the first day, the official event started with a session entitled 'Business as Usual?'. In his Keynote presentation, Prof. Ulrich Reimers (Technical University of Braunschweig and former long-serving chair of the DVB Technical Module) described why DVB was created as a private association twenty-five years ago. At that time, European regulators were convinced that the future of television was D2MAC and HDMAC and transmission systems which were still based on analogue technology. At the same time, digital technology for video delivery was already on the horizon and European broadcasters and the CE industry were concerned about ending up on a dead-end road. This was the start of the DVB Project, which was extremely successful in driving the evolution from analogue to digital as well as further developments such as the transition from SD to HD and, more recently, from HD to UHD.

Andrzej Garapich, deputy director for marketing at Polish Public Television (TVP), described the media landscape of his home country. Polish TV households rely on satellite (35%), cable (28%) and terrestrial (36%) for broadcast reception, all based on DVB specifications. Digital Terrestrial Transmission (DTT) is typically free-to-air whereas satellite is predominantly Pay TV. Cable transmission is still mostly analogue. Terrestrial television also includes a mobile bouquet offered on DVB-T under the brand name, TV Mobilna. Like many other broadcasters, TVP is confronted with the question of how to handle OTT content delivery as VoD, and other similar

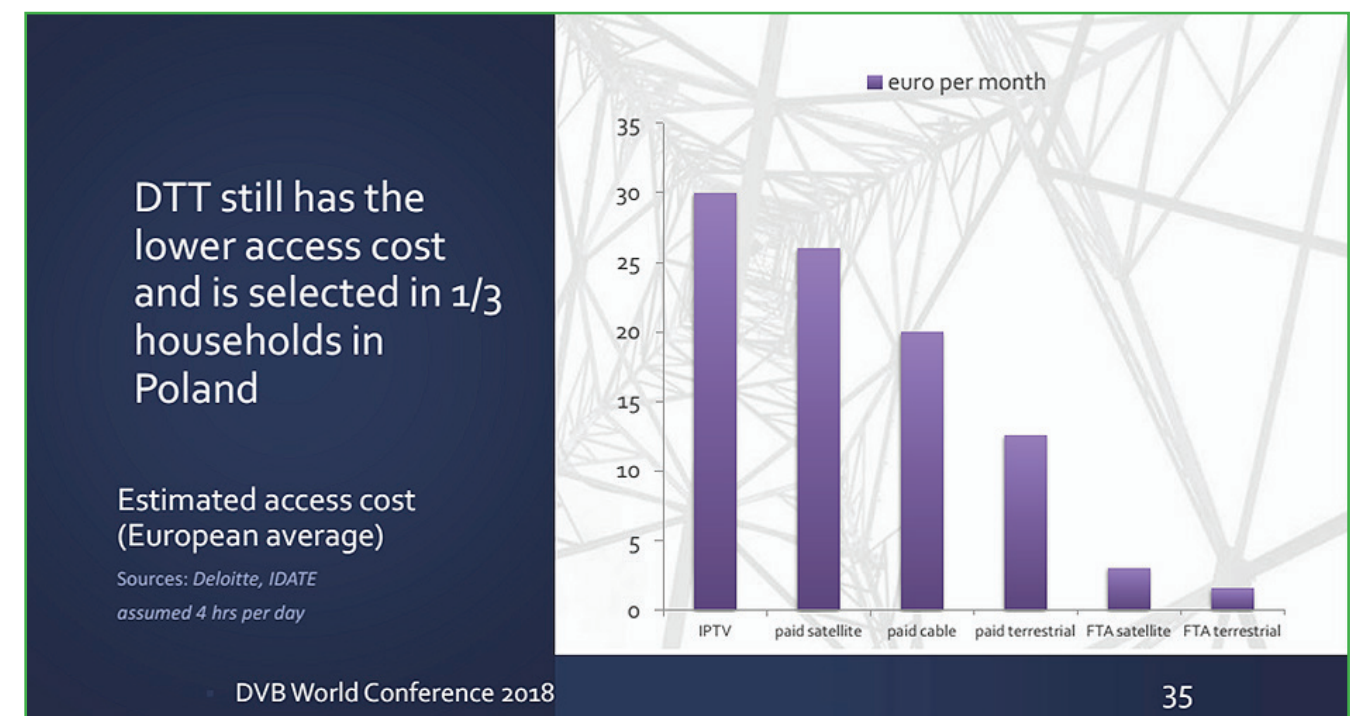
services, which are becoming more and more popular in Poland. TVP has decided to embrace VoD services and has become a prominent OTT provider.

The second day focused on ongoing activities in DVB and covered a wide range of topics. The keynote presentation was provided by Chris Lintz, distinguished engineer and architect with Comcast. He provided an overview of the transition of CATV from a basic "cable-assisted TV". For the future, he predicts a clear trend to IP-based transmission for various reasons:

- Continued growth of the channel line-up.
- Continued growth of internet services.
- Support for mobile and 2nd screen devices.

In addition to cable, DVB also provides the transmission standards for satellite and terrestrial. Holger Meinzer, (Media Broadcast), presented an overview of the most challenging tasks and solutions associated with the successful introduction of DVB-T2 with HEVC in Germany. According to Mr Meinzer, there were two major lessons learned from this successful conversion:

- Clear communication of the technology change rather than a lengthy simulcast period.
- Not to underestimate the relevance of marketing and sales.



The current status of satellite was covered by David Peilow of the European Space Agency (ESA). In his presentation on "New Satellites on the Horizon", he provided an outlook on the latest development and trends.

IP technology for distribution

In addition to broadcast via satellite, cable and terrestrial, IP-based delivery of AV services has become a significant delivery scheme. Consequently, several presentations at the conference focused on IP technology for distribution. The first aspect covered was the special challenge of IP delivery of popular live events, with each viewer receiving a dedicated signal in a unicast approach. When there are many viewers, the load on the IP network and the cost for the broadcaster will increase.

To address this problem, DVB has started to work on a specification for 'Adaptive Media Streaming over IP Multicast', which will bring multicast scalability to live video broadcast. Muriel Deschanel (b-com) reported on the current status of this activity. The corresponding DVB group, TM-IPI, has specified the reference architecture, which is available for comment on www.dvb.org. Phase 1, targeted at vertically integrated deployments, will be completed by the end of 2018. Phase 2 will concentrate on horizontal integration models where there is an organisational split between the network service provider and the content distribution functions.

Another important IP-related activity is DVB's new initiative on OTT delivery, DVB-I. Pauls Szucs (Sony) introduced this topic in his presentation "DVB-I: A New 'Physical' Layer?". The "I" in DVB-I refers to the use of the "Internet" for OTT delivery; typically, as a CDN overlaid, edge-assisted, adaptive delivery media cloud. The objective of DVB-I is to enable DVB services to be discovered and consumed by devices with basic internet connectivity, providing a similar user proposition to that of a DVB broadcast service. This also includes addressing the challenges of the current application (app)-based ecosystem which are:

- Inconvenience for the consumer of switching between apps or missing apps on otherwise perfectly functional receivers.
- CE manufacturers having to support multiple solutions for the same function such as codecs, ABR solutions, DRM systems and user interface constructs.
- Broadcasters needing to reach the audience efficiently and reliably.

As illustrated in Figure 1 below, DVB-I will rely on specifications such as DVB-DASH, Low-Latency DASH (LL-DASH) and Adaptive Media Streaming (MABR). Service Discovery and Signalling, as well as the corresponding metadata, will be key elements of the new specification.

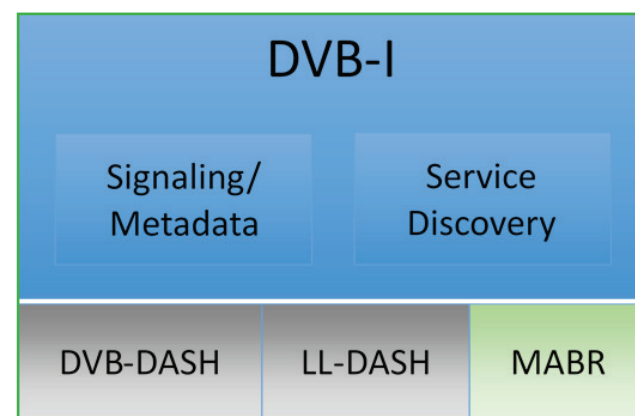


Figure 1: DVB-I and related DVB specifications

IP-based delivery is also instrumental for Targeted Advertising (TA). Vincent Grivet (TDF) reported on the ongoing TA activities in DVB. The Commercial Module (CM-TA) is working on the Commercial Requirements (CR) for a horizontal broadcast use case. Additional use cases such as nonlinear, OTT or IPTV will also be considered. The development of the specification in DVB is progressing well. CRs are expected for June 2018 and will be the basis for the technical specifications to be provided by the DVB Technical Module.

New developments and technologies

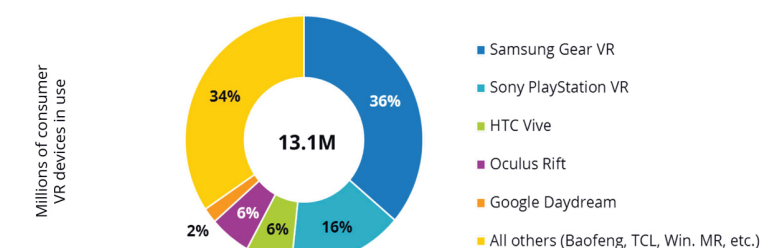
The third and last day of DVB World typically focuses on forthcoming developments and technologies. The keynote presentation was provided by Mathias Coinchon, CTO of RTS, the public broadcaster for the French-speaking part of Switzerland. His presentation, with the provocative title "When is a broadcaster not a broadcaster?", touched on the challenges of public service media (PSM) organisations in a changing media landscape.

RTS is currently undergoing the transition from a classical broadcaster, providing and distributing linear radio and TV channels, to a "transmedia content provider", which has to produce content and deliver it in various formats to several multimedia platforms. One of the challenges is technology beyond HD. Is there a real value for UHD premium content, which will justify the necessary investment in studio infrastructure and transmission? RTS looks to DVB and SDOs for guidance and directions. Another challenge for RTS is how deal with OTT.

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Headset installed base

Worldwide Virtual Reality Hardware Installed Base By Major Platform, Year-End 2017



- The VR device installed base rose 82% last year; the comparable year-end '16 figure was 7.2M
- Totals exclude business/enterprise sales as well as nonelectronic viewing accessories (Google Cardboard as well as cloth, plastic or foam smartphone holders from a range of manufacturers)
- Gear VR ended 2017 with the largest installed base (>4.7M devices in use, 36% of the global total)



Source: IDC's Worldwide AR/VR Headset Tracker

Source: IDC's Worldwide AR/VR Headset Tracker

Source: « 2017 Virtual Reality year in review by IDC and Unity »

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For RTS, this is a new world, driven by information technology, relying on apps, APIs, cloud-based services and CDNs. This also provides new standardisation challenges. Mr Coinchon stated clearly that the time when an SDO 'standardises and forgets' has passed. Now he expects an SDO to also take care of marketing, lobbying, regulation, networking, guidelines, business cases, prototypes, example code and libraries, etc. HbbTV is one of the organisations already going in this direction of providing prototype solutions and required test cases. Mr Coinchon recommended that DVB should also adopt this method.

3D was mentioned in passing as 'a fad that did not develop into anything more'. The question asked in the session given by BCOM was "Is VR Still the Future?" A list of possible venues where VR will give the best effects was given which included VR Cafes, VR Arcades, VR Experiences at events, VR Escape rooms, VR Cinemas, Amusement park attractions and Museum exhibitions. Certainly, growth last year was very positive. Apps and games have also shown significant growth.

5G is a technology topic that is currently receiving significant attention. Stefan Ilse, a researcher from the Technical University of Braunschweig, provided an informative and objective introduction to the state of 5G standardisation and the extent to which broadcast is supported by 3GPP specifications.

He started his presentation by pointing out that the main use case for mobile broadband is video. Already, 60% of all mobile data traffic is video and this number is forecast to increase in the future. When it comes to broadcast, 3GPP published its Release 14 in 2017 specifying a Further evolved Multimedia Broadcast Multicast Service (FeMBMS). This new release, which was notably driven by the EBU, BBC, Rai, SWR and IRT (all Members of DVB), is a significant improvement over the existing eMBMS specification.

Most important is the size of the SFN cells, which are now increased to 60km by introducing a longer cyclic prefix. Furthermore, there is a dedicated broadcast mode in which

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What is Re-Use 1?

- *Re-use 1 lets you use 1 RF channel to cover the entire region.*
- *Re-use 1 lets you use every RF channel in every service area, for any content (unlike SFN).*
- *With a more rugged signal format, each channel carries less data and fewer programmes*



Idealised coverage map

100% of the capacity in a cell can be used for broadcast. For the next generation 5G technology, an “early drop” of the air interface (New Radio (NR)) Release 15 specification has been available since December 2017. It defines a “non-stand-alone” mode which still uses the LTE core network. A “stand-alone” mode for a 5G core network will follow. First deployments of the final version of Release 15 can be expected by the end of 2019.

Mr Ilse pointed out that broadcast transmission based on 5G NR will not be supported in 3GPP Release 15. Instead FeMBMS, based on LTE, will still be supported under the 5G “label”. He expects a real 5G NR broadcast mode at the earliest in Release 17, which may be specified starting in 2020. This means that the rollout of true 5G broadcast is still several years away.

Two presentations were provided for the session, “WIB – The New T3”. The first was by Chris Nokes of the BBC and the

second by Peter Barnet of Mandercom. It all centred around DVB T2 and the ability of T2 to reject reflected/delay signals up to a certain time window. We were introduced to the Shannon formula which describes how and why this works.

The topics described above give a snapshot of the overall conference programme. A long list of additional topics, such as Conditional Access, Emergency Warning Systems and interactivity based on HbbTV, to name just a few, were also addressed.

The next DVB World will take place from **11-13 March 2019** in Dublin, and we hope to see you there! For further details, see www.dvbworld.org



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