DVBSCENE

DVB Digital Video Broadcasting

Issue No. 45

March 2015

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In the year 2030
A Word From DVB

Peter Siebert
Executive Director

Broadcast TV to be extinct by 2030! This interesting statement was a prediction made by Netflix CEO Reed Hastings some weeks ago. Personally I am a Netflix customer and I must say to Mr Hastings that I like the services offered by Netflix. However, independent of how much I appreciate the convenience of TV shows and old movies on demand; would I give up broadcast TV? There are certain features which nonlinear services do not deliver. First of all there are events we want to watch in a linear fashion, for instance sporting events. It is difficult to imagine how the final of the FIFA World Cup could be watched on Netflix. Secondly I do not always want to make a conscious decision what to watch. Sometimes when coming home from work I switch on the television, zap through the channels and just want to be surprised. And then there is the ease of the actual use of linear TV. Let's face it: setting up an internet connection and dealing with a computer or a similar device is not everyone's cup of tea. We probably all know people that would not think of watching TV any other way but linearly. Finally, there is the trust we have in a broadcaster. If I had the choice of watch the news from the BBC or Netflix — the answer is clear. News is very important for us and we definitely want to get it from a trusted source.

My answer to Mr Hasting's statement is that, yes, nonlinear services play an important role in media consumption and will become even more relevant in the future. However, this will not make broadcast TV obsolete. There have been many new technologies introduced over the last decades, but we still read books and newspapers, we continue to listen to the radio and go to the movies. Nonlinear TV is the new kid on the block, but this does not mean that existing media platforms such as broadcast TV will disappear.

So, when 2030 arrives there will be an agreeable coexistence of nonlinear and linear services. However, we will have to wait and see if Netflix will still be around.

New Standards

TS 102 606-1 Ver. 1.2.1: Generic Stream Encapsulation (GSE); Part 1: Protocol (Jul - 2014)
TS 102 606-2 Ver. 1.1.1: Generic Stream Encapsulation (GSE); Part 2: Logical Link Control (LLC) (Jul - 2014)
TS 102 606-3 Ver. 1.1.1: Generic Stream Encapsulation (GSE); Part 3: Robust Header Compression (ROHC) for IP (Jul - 2014)
TR 101 290 Ver. 1.3.1: Measurement guidelines for DVB systems (Jul - 2014)
TS 103 287 Ver. 1.1.1: Modulator Interface (C2-MI) for a second generation digital transmission system for cable systems (DVB-C2) (Sep - 2014)
EN 302 307-1 Ver. 1.4.1: Second generation framing structure, channel coding and modulation systems for Broadcasting, Interactive Services, News Gathering and other broadband satellite applications; Part 1: DVB-S2(Nov - 2014)
TS 102 034 Ver. 1.5.2 : Transport of MPEG-2 TS Based DVB Services over IP Based Networks (Dec - 2014)

New Members

Loewe Technologies GmbH is a premium home entertainment brand that designs, manufactures, and distributes products that stand out through their clear, precise, and elegant design. **www.loewe.tv**

TechUK is the trading name for the Information Technology Telecommunications and Electronics Association that represents more than 850 technology companies based in the United Kingdom. **www.techuk.org**

Xcrypt Inc. is an innovative solution provider of conditional access systems for digital pay TV and content delivery. **www.xcrypt.co.kr**

Published by the DVB Project Office,
c/o European Broadcasting Union,
17a Ancienne Route,
CH-1218 Grand Saconnex, Switzerland.

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Printed by New Goff n.v.

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Enabling Interaction

DVB-CSS Specification Family

Kevin Murray, Chair TM-CSS

What does the DVB-CSS (Companion Screens and Supplementary Streams) family of specifications cover? In the simplest and most general terms, the specification is about providing the ability for devices (such as tablets or smartphones) to interact with the television (or STB) and so become part of the overall television experience. This experience has expanded over time – it started with just pictures and sounds on a single device. Other components and devices have been added, starting with telephone voting and now including a wide range of supplementary material (audio, video and graphical/data), via a range of routes including the internet. This specification family builds on this change and defines a framework that allows applications on smart devices to construct an integrated, synchronized content experience over the home network potentially drawing together many components from multiple sources.

The specification family currently comprises three parts: the first is a generic architecture and framework giving an easy introduction to the ideas, approaches and terminologies used. This is a good starting point to get an overview of the specifications as it also describes the interface points that are defined in the subsequent parts.

The second, and largest, part provides definitions for many of the interfaces. These interfaces address:

- content identification – working out what is on the television,
- content synchronization – allowing a device to display content synchronized to that on the television,
- triggers – broadcast markers that are of interest to the application,
- identifiers and timeline resolution – a Material Resolution Service that can translate identifiers and timelines, providing updates to these translations as needed, and
- clock synchronization – the ability for the devices to have a shared clock.

These interfaces provide flexibility to accommodate a range of use cases. For example, any given television program may be transmitted many times over many different delivery mechanisms, some of which are outside the control or detailed knowledge of the original content owner. Specific content identifiers and timelines can be carried where possible, or can be obtained via translation from arbitrary values using the Material Resolution Server. Both cases include support for a range of timeline related use cases. As not all this flexibility is needed in all cases, the specifications allow for simpler deployments or usage as appropriate.

The final part defines how the devices find each other, and builds on UPnP (Universal Plug and Play), specifically the new Application Management extensions of the UPnP MultiScreen extensions.

Figure 1 shows the protocol stacks used and defined in the specifications for both TV and companion devices, and indicates which apply to just one and which to both of the device families. Where the protocol applies to both, typically this means that the television implements the server side of the protocol and the companion device the client side of the protocol. Figure 2 shows how the devices and parts of the specification are linked by the interfaces and protocols.

Kevin Murray is a System Architect in SPVSS in Cisco. His work has included contributing to the development of HD, new coding techniques, advanced DVRs, IP delivery of TV and most recently to the use of companion screens.

Most (though not all) of the interfaces are designed to be friendly towards HTML-5 applications, whilst not placing significant complexity or overhead on native applications. For instance, communications are over WebSocket protocols and use JSON (JavaScript Object Notation) formatted messages. The exceptions to this are the discovery protocols based on UPnP[1] and the lowest level clock synchronization protocols, which use UDP (User Datagram Protocol) for timeliness reasons.

Whilst only recently completed and published, the specifications are already being referenced. HbbTV 2.0 is planned to reference much of this functionality, to support synchronization between applications, screens and other devices.

Specification Availability and More Information

DVB has also produced a Fact Sheet with more technical information on the specifications; this is available from the DVB website. Part 2 of the specification family should be available as an ETSI specification as ETSI TS 103 282-2, with parts 1 and 3 expected to follow by April. Parts 1 and 3 are also available as DVB Blue Books A167-1 and A167-3.

[1] W3C currently has work underway exploring the feasibility of introducing access to such functionality within browsers using the Network Service Discovery.

Figure 1

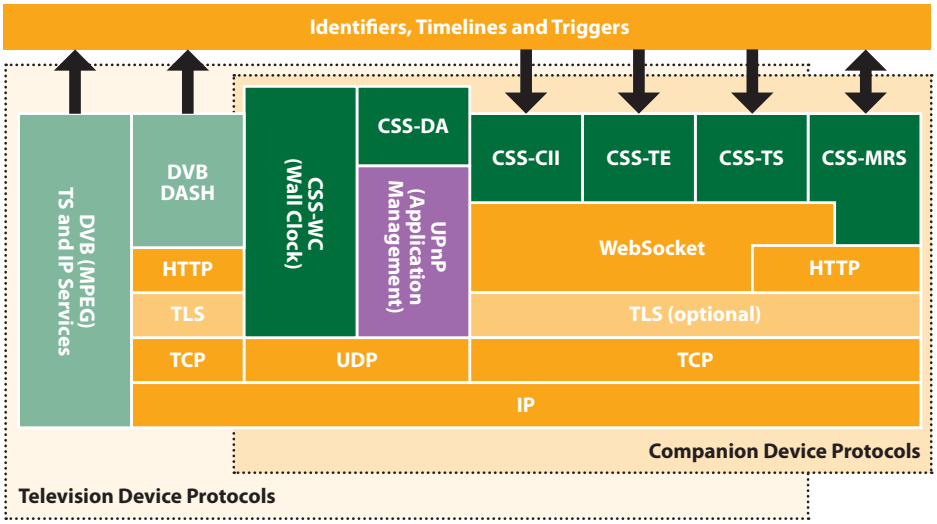
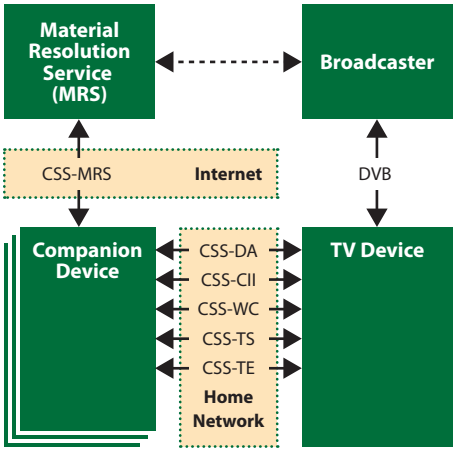


Figure 2



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Access for All

DVB Access Systems Make Sense

David Wood, EBU

David Wood
EBU Consultant - Technology and Innovation

The headline "Subtitle Hell!" draws an audience. In recent months, from San Francisco to London, you could read about how live subtitling of TV programs led to screens of gobbledygook. Sometimes it can be amusing - for example, the tennis commentator whose remark "This is a big miss" came out as "This is a bigamist". But it's usually annoying. Read on and later we will explain why this happens. Providing help for those with disabilities to enjoy television is very 'selfish'. The older we get, the more our sight, hearing, and cognitive abilities can weaken. Sooner or later we may all need help to experience the media.

And there is also a large 'wave' approaching. Several years ago the United Nations agreed the 'Declaration on the Rights of Persons with Disabilities'. It demands that signatory States take all reasonable measures to make the media accessible to everyone. It is legally binding, and sooner or later, broadcasters will need to provide the tools to help those with disabilities.

The DVB duly prepares specifications for access systems. But the world's media do not take all the measures they might. The fundamental barrier is often funding.

Access services today are only of value to a proportion of the viewers, and the broadcaster usually has no additional funding to cover the cost of providing them. They argue that they need both the technology, and the help to pay for its use. The reality is that access systems' use in the world today is proportional to the amount of national regulation that there is, and the wealth of the broadcaster.

The most needed and used access system is subtitles for the hard of hearing (aka closed captions). Preceded by the use of Teletext and the US closed captioning system, the DVB Subtitling system has served digital broadcasting well. We should also not underestimate the value of providing 'spoken' versions of subtitles, for those who cannot read the written versions.

When it seemed that 3DTV would be popular, DVB developed a system that moved the image of the subtitles forwards and backwards in a 3D scene to follow the 'depth position in the scene' of the person speaking. Today work is in hand, thanks to groups led by Giles Godard-Brown, BSkyB, and Peter Cherriman, BBC, on a subtitling system for DVB UHD-1 Phase 1.

The next most useful access system is probably 'audio descriptions'. This brings the viewer, with sight disabilities, an insight into what is happening in the scene by a voiced description ("she moves to the window") heard in the pauses in the official dialog. The broadcaster can provide a second sound channel that has the combination of the dialog and the audio descriptions, or a second sound channel with just the audio descriptions that is then mixed with the dialog in the TV set. The resulting mix isn't always perfect, and it would be good to have mixing standards agreed.

Another important access system is 'signing'. We sometimes see a 'signer' person cut into the TV image, who translates the dialog or effects to sign language. There is no technical trick here, and this is 'brute force' technology that consumes a channel - and tends to irritate those who don't need the signing. High on our wish list is a system that will allow the viewer to choose whether the signer is cut into the image or not. A great idea for being able to do this is to use a hybrid system like HbbTV, which will bring in the optional signer via internet. We await a specification for this.

There is a whole list of technical options for access services that may, we hope, appear in the years ahead. Alas we have no space to examine them all here. But one more that enjoys recently agreed DVB specifications is 'Clean Audio'. It is originally the work of Harald Fuchs and the team at the Fraunhofer Institute in Nuremberg. The viewer, with a suitably equipped TV and TV broadcast, can adjust the relative levels of foreground and background in the audio. This can make dialog much clearer and more enjoyable to those with hearing disabilities.

Let's return to the gobbledygook. The reason that live subtitles can be incorrect is that there is no time to check them. An individual, the 'respeaker', repeats the dialog as he/she hears it off the screen, and a computer translates his/her voice into text. I asked Pilar Orero from Barcelona University, one of the world's experts in subtitles, how the accuracy of the subtitles could be improved. She explained that they can be improved if the live TV program is, in reality, delayed by 30 seconds before being broadcast, and thus the subtitles can be checked by a second reader/corrector person. Could the world's broadcasters be persuaded to do so? I am sure certain tennis commentators would be pleased.

Accurate subtitles can be a problem with live programs – the commentator here actually said "That is a big miss".

Standardizing the Landscape

Higher Dynamic Range & Wider Color Gamut Video

Edouard Francois, Technicolor

Current TVs support Standard Dynamic Range (SDR) content with brightness in the range of 0.1 to 100 candelas/m2, and they are typically able to render up to 300 or 400 cd/m2. That range is significantly smaller than what the human eye can see in real life. Future TVs are expected to give a viewing experience closer to real life experience, by supporting Higher Dynamic Range (HDR) and Wider Color Gamut (WCG). These two new features are henceforth considered as important as the increase of resolution or frame rate for the successful deployment of UHDTV services. In order to enable interoperable ecosystems, multiple standardization organizations have launched in parallel new efforts to develop relevant standards for HDR and WCG video. The figure below illustrates on a simplified video workflow where those different organizations are mostly involved. The specification of the signal format, both for production and distribution, is principally addressed by SMPTE and ITU-R. The two are working on the definition of the next recommendation of HDR and WCG video formats. Their work relates in particular to the specification of nonlinear transfer functions (aka OETF/EOTF) aiming at compressing (quantizing) the HDR and WCG signal for the production and distribution, and decompressing it for the rendering. ISO/MPEG and ITU-T/VCEG, focused on video compression, have created the JCT-VC in charge of the joint specification of the HEVC standard and its extensions. In parallel, MPEG is working on the support of HDR and WCG video coding. More details are provided below. The transmission side is addressed by standardization organizations, such as DVB and EBU, ATSC, and ARIB. They are currently discussing the system definitions, specifications and timeline for the deployment of UHDTV. Support of HDR and WCG is part of the discussion. Consumer storage is more specifically addressed by the Blu-ray Disk Association (BDA) that has announced the arrival of HDR Blu-rays for end 2015. Finally the interfacing with digital equipment (set-top boxes, players, displays, etc.) is addressed by the HDMI Forum and the Consumer Electronics Association (CEA). They are including the HDR and WCG features in their new requirements.

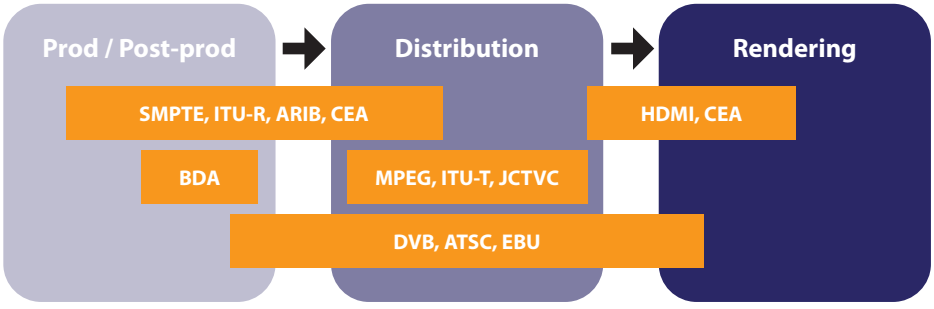
After having issued the first version of the HEVC specification in January 2013, the JCT-VC has produced the Format Range (RExt), Scalability (SHVC), and Multiview (MV-HEVC) extensions in July 2014. This latest version already partly addresses the HDR and WCG support. The 'Video Usability Information' (VUI), an optional container providing information on the signal format, has been completed by adding the support of a new HDR-oriented transfer function (also specified in SMPTE as ST 2084) and BT.2020 color primaries. Different SEI messages are specified to help the conversion of the decoded HDR signal at the receiver side: 'mastering display color volume' (also specified as SMPTE ST 2086), 'tone mapping information' (already defined in AVC/H.264), 'color remapping information' and 'knee function information'. A new profile oriented on consumer applications (Main10) has been defined with the support of higher bit-depth coding (10 bits instead of 8 bits as commonly used in AVC/H.264). Finally, the scalable extension of HEVC (SHVC) includes a specific tool, named Color Gamut Scalability (CGS), dedicated to the bit depth and color gamut compatibility issues.

On the MPEG side, the work on HDR video coding started in July 2013, with the definition of requirements (dynamic range and contrast ratio, bit-depth, color space, resolution, etc.) aiming at covering different application fields. The group is preparing a Call for Evidence (CfE) to evaluate the performance of HEVC, and of potential complementary solutions. The CfE was due in February 2015 with evaluation of responses in June 2015. The next steps will depend on the conclusions from this CfE. In a first scenario, HEVC as is looks sufficient to address the requirements and no alternate technology shows a noticeable higher potential (in terms of bitrate reduction, or of additional features). In a second scenario, some extensions to the HEVC standard are required to properly support HDR and WCG video coding, and a new extension of HEVC should be issued during 2016.

The synchronization of these different standardization efforts is a key factor to avoid the development of fragmented standards and to enable a good interoperability. The coming twelve months are critical and will provide a much clearer picture of the standard technical blocks that will allow the introduction of HDR and WCG in the video market.

Edouard Francois is a Principal Scientist at Technicolor, with a major focus on video coding and standardization. He has been participating to different standardization activities, including the specification of the HEVC standard and its extensions. He is also involved in HDR and WCG video coding and is co-chairing the MPEG activity working in this area.

Simplified video workflow and the related involved standardization organizations



Looking at the Future of Terrestrial Broadcasting

Q & A with DVB-T Commercial Module Chairman Vincent Grivet

The DVB Commercial Module, the group whose responsibility it is to determine the market requirements for the future development of DVB specifications, has created a new sub-group tasked with the specific mission to foster the thinking in DVB on the short to mid-term evolution of terrestrial broadcast and to gather commercial requirements for the further development of DVB terrestrial specifications.

DVB Scene asks the group's chairman, Vincent Grivet, some questions on the scope and goals of the mission.

DS: Can you elaborate on the scope of this mission and what types of delivery, both existing and for the future, it will encompass?

VG: DVB Members are operating in an environment that is experiencing several profound changes. There is a need in this context of big changes to think about the future of DVB's terrestrial specifications; how should they evolve to meet the new challenges that arise, and also take advantage of new opportunities where terrestrial broadcast can leverage its strengths? This is what the CM-T (Commercial Module Terrestrial) will do.

The CM-T group is still quite young so, unsurprisingly, there are as yet no deliverables (other than our Terms of Reference!). In terms of future delivery, there are two main areas. The first one is a so-called "Long Term Vision for Terrestrial Broadcast" that the CM-T group is putting together, to be submitted to DVB's Commercial Module (CM), Technical Module (TM) and Steering Board. This exercise should provide a point of reference for future planning of DVB's activities linked to terrestrial broadcast; it should be released, within DVB, around mid-year. The other type of delivery will be the more classical DVB work of producing commercial requirements (CRs); the CM-T will draft CRs for a number of situations, use cases, where it seems that the existing DVB specification(s) is not fully in line with the market needs.

DS: What do you see as the key factors to be taken into account in shaping the evolution of terrestrial broadcast?

VG: As it is impossible to mention them all, I'd like to cover three that really stand out in my mind.

First off there is on demand. More and more, media and TV consumption will be on demand, which is not of course the traditional sweet spot of "broadcasting" that is more associated with live, or linear viewing. But I am convinced that terrestrial broadcast has a great role to play in enabling on demand viewing because it is quite likely that current broadband networks cannot do it alone.

Next is mobile. Traffic on mobile (data) networks is doubling roughly every year, and a large part of the traffic (and of the growth) is TV and video; there will be a huge benefit, in terms of cost and of quality, if such mobile traffic can be delivered through a broadcast /multicast approach versus a unicast approach. This is even the case when it is not TV, but for example, when it is a magazine with HD pictures or the latest iOS software update that millions of devices want to download in the same week. This is another context for which we need to find a DVB terrestrial broadcast answer.

And then there is the issue of spectrum reduction. Though the details are not clear, we know that the spectrum reserved for terrestrial broadcast will decrease in the future (we are talking about a loss of 30 percent of assigned capacity – this is huge!). Do we have fewer services to carry with such a reduced spectrum allowance? No, on the contrary we have the "normal" existing TV, plus on demand, plus mobile and not to mention the progressive introduction of UHDTV. Our early work in CM-T suggests the increase in demand is a factor of 1.7x to 2x and if you combine this with a reduction in spectrum (by a factor of 0.7x) it means you need to find improvements bringing a 2.5x to 3x factor in efficiency. About half of this improvement has already been identified (but not implemented), with things like HEVC, DVB-T2, etc., and the other half still needs to be found!

Vincent Grivet is Head of Broadcast Development at TDF, the leading operator of terrestrial broadcast in France. He started his career in the Orange Group, where he held various positions in product management, M&A/International Development. He was CEO of Orange's internet operations in Belgium (Wanadoo at that time) and Board Member of Ziggo the Dutch cable operator (Casema at that time). He was co-founder and MD of Maxtel, an entrepreneurial wireless broadband start-up, and joined TDF Group in 2007.

Vincent is a graduate from Paris Tech Polytechnique and Telecom schools. He is representing TDF at the DVB's Steering Board and Commercial Module and is chairing the CM-T group.

DS: What criteria and goals will the group be taking into account in defining the work's scope, making recommendations and proposals, as well as prioritizing and producing its Commercial Requirements?

VG: The first and most important criterion is to ensure the long-term relevance and social usefulness of terrestrial broadcast in the digital and media landscape. There is a lot that terrestrial broadcast can do to serve, at low-cost and with high-quality, the entertainment needs of the population in Europe and in other areas of the world. We need to make sure that the proper DVB specifications and technology are in place so that this contribution reaches its goal. Then there's a variety of other considerations that need to be factored in, including: the trend towards a few major global standards; the need to decrease energy consumption; and not forgetting the practical implementation and roll-out considerations.

DS: How do you see the relationship and potential cooperation of CM-T with bodies outside of DVB such as ATSC or 3GPP?

VG: There is a need for much more cooperation and alignment at the global level, and chiefly with these two leading organizations. Regarding the ATSC, we should make sure that the respective future evolutions of DVB and ATSC terrestrial specifications converge and eventually become the 4G, or even 5G of the broadcast world. As for 3GPP, as we said, it is clear that broadcast will become a central component of the way a mobile device is fed with digital content. To make this happen, cooperation between 3GPP and DVB is both natural and highly desirable. CM-T will be instrumental in supporting DVB's endeavours to execute such liaisons.

DS: Readers can look forward to receiving more news on the group's activities later this year.

Today's devices are changing the digital and media landscape

In the future terrestrial broadcasting can help meet the growing demand for "On Demand" services

Improving Performance

S2X Implementation Guidelines

Vittoria Mignone, Rai

Vittoria Mignone received the "Laurea in Ingegneria Elettronica" degree from Politecnico di Torino, in 1990. She has been with the Rai Research Centre since 1992, involved in the studies for the definition of the ETSI Standards for digital television by satellite, cable and terrestrial channels. Her activities are in the field of advanced digital modulation and channel coding techniques for satellite and terrestrial transmissions. She is author of patents and technical papers. She is the editor of the Implementation Guidelines of DVB-S2.

At its January 2015 meeting, the DVB Technical Module approved the implementation guidelines of the new extensions of the DVB-S2 standard EN 302 307, namely DVB-S2X. The document will now be considered by the DVB Commercial Module and Steering Board for publication as a DVB BlueBook and submission to ETSI. As is the case with the standard, the implementation guidelines document, identified as ETSI TR 102 376, is divided in two parts, where Part 1 is the revision of the guidelines of the original DVB-S2 specification and Part 2 is the implementation guidelines of DVB-S2X.

Starting from the commercial requirements that drove the definition of S2X, the document describes what the new extensions to DVB-S2 allow, both in the core markets: Direct-To-Home (DTH), broadcast distribution, contribution, VSAT outbound and high speed IP links. It also deals with the emerging markets such as, airborne, rail and other mobile forward links, small aperture terminals for news gathering, disaster relief and similar ad hoc links, and VSAT forward links in regions prone to deep transient atmospheric fading.

There is improved performance in the core applications of DVB-S2, as well as operations in an extended SNR (Signal-to-Noise Ratio) range, from very-low SNR (VL-SNR) levels down to -10 dB, to very-high SNRs (VH-SNR).

To achieve this, DVB-S2X enhances the physical layer signaling to provide a finer granularity of operative points (i.e., more modulation and coding (MODCOD) schemes), enabling more flexibility with regard to optimizing channel usage. In addition, DVB-S2X allows the use of reduced roll-off factors (down to 5 percent) in order to decrease the occupied bandwidth, and introduces specific constellations for the optimization of satellite transmissions in the "linear channel".

DVB-S2X also improves some features of the satellite transmission at the system level. The ability to configure the scrambling sequence, which was normative in DVB-S2 for all applications except broadcast, is now specified for DTH as well. This allows systems to cope more readily with high level co-channel interference in multi-satellite environments. Analogously, Variable Coding and Modulation (VCM), allowing the changes in MODCOD configuration on a frame-by-frame basis, is now also normative for DTH. This permits the real time optimization of the transmission efficiency versus robustness, according to the prevailing atmospheric conditions or even to tailor services according to quality of service requirements. Channel bonding of up to 3 channels is permitted, which can provide an increase in throughput, by merging capacity across multiple transponders, thus enhancing the performance of the statistical multiplexing of services. The higher level protocols (i.e., GSE, GSE-lite) have been improved allowing for greater integration with IP based systems. The "all-IP streaming" capability has been introduced. The Super-Framing structure has been introduced, to open up the possibility to support advanced techniques for future broadband interactive networks such as intra-system interference mitigation, beam-hopping as well as multi-format transmissions.

The implementation guidelines extensively report on the achievable performance in the different application areas, also including a detailed description of the channel models that have been considered for the system evaluation.

Several examples are given on the use of the S2X tools. With the implementation guidelines, the reader can appreciate that the use of VCM in a Ku-band broadcasting satellite with a wide coverage will allow for the simulcast of a highly robust standard definition TV channel (targeting 99.9 percent availability of the average year) with an UHDTV channel (at 99 percent availability), giving about 30 percent gain with respect to DVB-S2 (accepting SD for 1 percent of the time). In Ka-band using a Multi-Beam broadcasting satellite, the gain will approach 100 percent. In the same scenario, the adoption of Channel bonding and Statistical Multiplexing can offer 11 percent more channels.

For professional and DSNG applications, high efficiency modulation schemes allow spectral efficiencies approaching 6 bps/Hz allowing for optimized satellite capacity usage. The achievable gains in regards to DVB-S2 are shown, rising up to 2.5 dB SNR gain for the same spectral efficiency,
or up to 21 percent in the sub 12 dB SNR region, and 51 percent in the sub 20 dB SNR region efficiency improvements for the same SNR value.

For broadband networks, the best expected performance gains of DVB-S2X are foreseen for future multi-spot beam systems where, thanks to the Super-frame, aggressive spectrum reuse schemes, together with advanced interference mitigation techniques, can be introduced to significantly boost the capacity (up to 100 percent) when compared to more conventional systems.

A Major Update

HbbTV 2.0

Jon Piesing, TP Vision

Jon Piesing is the vice-chair of HbbTV. He played a major role facilitating the convergence of the original French and German initiatives which together became HbbTV. Jon is now Director, Standardization for TP Vision, which manufacture Philips TVs for Europe and a number of other territories.

The recently published HbbTV 2.0 specification is the result of more than two years work in HbbTV as well as partner organizations including DVB and the Open IPTV Forum. The specification is a major update to the previous HbbTV specification adding new features to make existing services more attractive to the end-user or the service provider. It also enables new services such as push VoD; updates technologies from earlier specifications; and improves interoperability between services and terminals.

Figure 1 shows the intended context for HbbTV 2.0, a hybrid terminal (TV or STB) connected to a broadcast (satellite in this example), the internet and a companion screen device (mobile phone or tablet).

Two major themes of the specification are the addition of support for companion screens (tablets or phones) and synchronization to broadcast delivered content.

- An HbbTV application can ask for an app to be launched on a tablet or phone.
- An app on a tablet or phone can ask for an HbbTV app to be launched on a TV or STB using DIAL, the same mechanism used by Netflix and Chromecast.
- Apps running on a tablet or phone can exchange messages with an HbbTV app running on a TV or STB using the W3C/IETF WebSocket mechanism.
- An app on a tablet or phone can synchronize to broadcast delivered content on the TV using the DVB Companion Screen Specification (see page 4 of this issue).
- An HbbTV application can synchronize broadcast delivered video and broadband delivered audio/subtitles in the TV set or STB.

As well as these two major themes, other significant additions concern privacy, broadband subtitles, DVB-CI Plus 1.4 and push VoD.

- Privacy has become a major concern for SmartTV in recent years. The W3C "Do Not Track" specification is added, which enables consumers who do not wish to be tracked to clearly express this.
- Subtitles for broadband delivered content have been added based on work done in the EBU around the W3C TTML specification.
- In TVs supporting both HbbTV 2.0 and DVB-CI Plus 1.4, integration between the two has been added to enable a CI Plus CAM to descramble protected broadband delivered AV content initiated by an HbbTV app and to provide data to HbbTV.
- Support for delivering files containing AV content to a hard disc in a STB (or a flash card in a TV) for later consumption has been added. This could be relevant for content that needs more and reliable bandwidth than is available in a particular market.
- The most significant technologies that have been updated are HTML, video codecs and MPEG DASH.
- HTML and the technologies around it are updated to HTML5 and matching versions.
- The video codecs are extended to support HEVC as well as MPEG-2 and AVC. HEVC is supported for both UHD and HD. There is significant interest in HEVC for HD to enable current services to be offered at lower bitrates than today.
- MPEG DASH has been updated to refer to the profile of DASH defined by DVB. This includes a number of new features which will make deployment of DASH services easier.

The HbbTV 2.0 specification builds as far as practical on the work of others, including DVB. Figure 2 illustrates this, showing in particular how it builds on the work done in DVB and in the Open IPTV Forum as well as the basic work done in ISO/IEC and the W3C.

The first HbbTV 2.0 receivers are expected to appear in the market in 2016. HbbTV will award a contract for a test suite for receivers in April/May 2015 with deliveries during the remainder of 2015. This should permit the release of a validated and approved test suite some time during 2016.

Figure 1

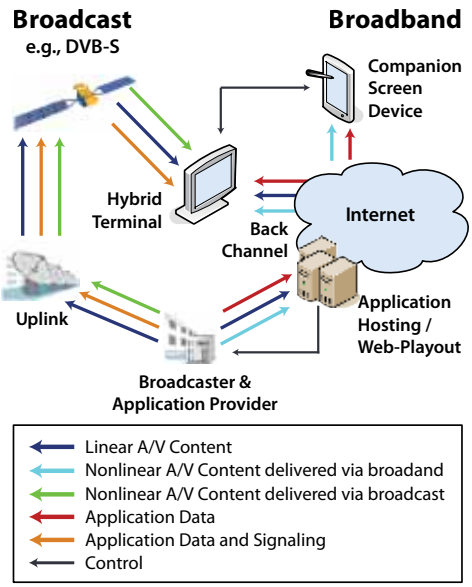
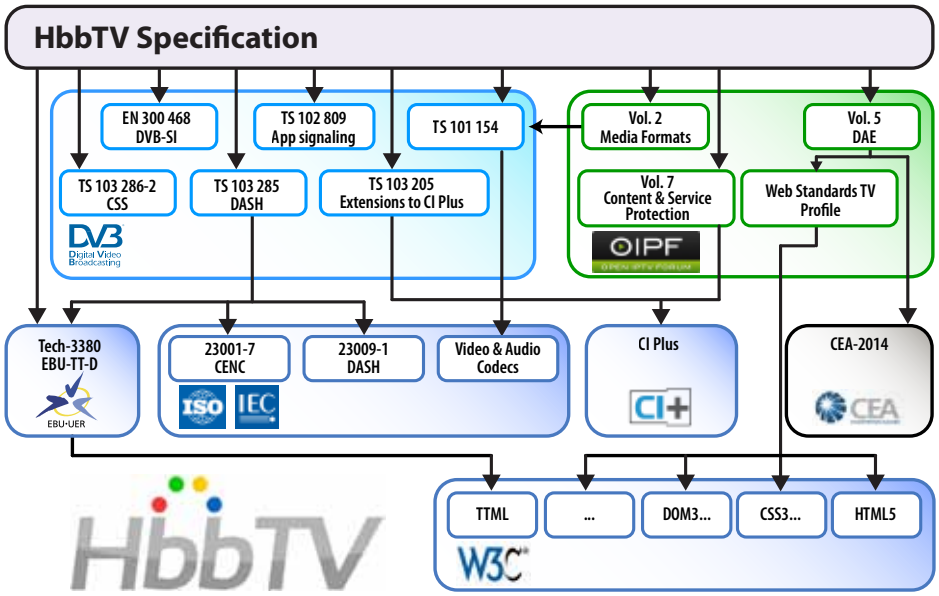


Figure 2



Saving Lives

Regional Early Warning Systems

Richard Lhermitte, ENENSYS

Richard Lhermitte is Vice President of Sales and Marketing at ENENSYS. He has been with ENENSYS since 2007 in a variety of roles. Prior to that he worked with Thomson and Thales.

December 26, 2014 saw global remembrance of the horrifying events of a decade ago: the Indian Ocean tsunami. According to the U.S. Geological Survey, 227,898 people died. With its epicenter off the coast of the Indonesian island of Sumatra, coastlines across Asia-Pacific suffered.

One of the key issues subsequently highlighted was the lack of early warning systems to alert populations to the impending disaster. We say impending because of course the tsunami didn't strike in a uniform way, rather it travelled vast distances – as far as South Africa – before it struck coastlines. This was anything from 15 minutes to seven hours or so after the earthquake. This means that a warning system – or systems – could have saved lives.

Asia is not alone in suffering natural disasters, but it's the most active region. According to 2011 figures from the Natural Disasters Data Book, "By region, Asia is the highest in the indices of disaster occurrences and number of people affected, and economic damage. Asia accounts for occurrences 44.4 percent; number of people killed, 82.0 percent; number of affected people, 94.0 percent; and amount of economic damage, 88.7 percent."

The tsunami highlighted how unprepared many countries across the region were. Since then there have been ongoing efforts – not least by the ABU and ASEAN member countries – to improve early warning systems and to cooperate far more.

At this point we'll separate out the sharing of weather and other vital information between countries from the timely dissemination of that information to populations. What role does broadcast have to play in this dissemination? Specifically DTT networks?

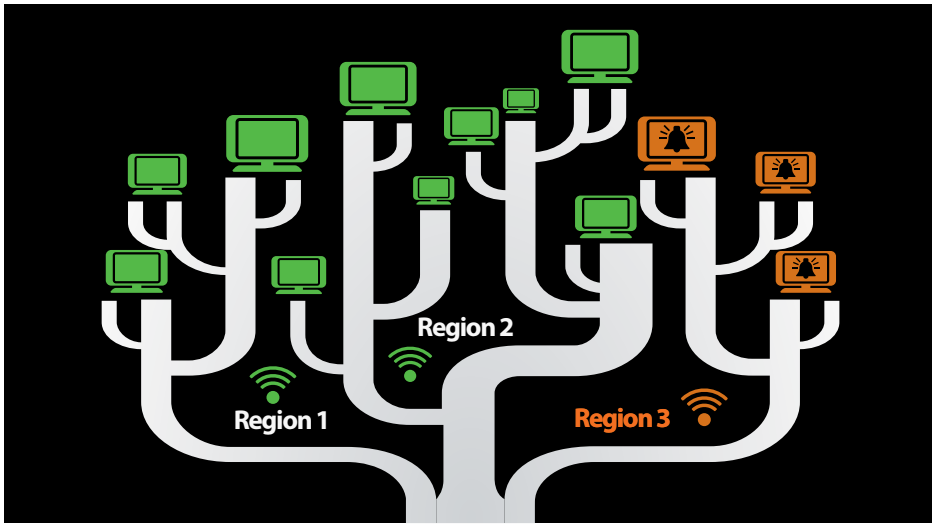
According to a May 2014 report from Digital TV Research, the number of DTT homes will grow to 1.68 billion globally by 2020, a 185 percent increase from 2010. DTT deployments are growing across Asia, recent network rollouts in Thailand being prime examples.

These networks have a clear role to play going forwards in terms of Regional Early Warning Systems (REWS). As a company, and as part of our overall DTT regionalization technology strategy, we have been exploring optimum ways to reach populations – on a regional basis – using existing DVB infrastructure to provide an easy-to-deploy, effective REWS, using DVB-T2 or DVB-T transmissions.

We wanted to develop a system that required no specific receiver software, nor modifications to receivers. Therefore the aim was to do this at the network and not at the receiver level.

Operators can now replace all the video services in a DTT multiplex with an emergency service. So if a network has eight services in one mux from different broadcasters, when an operator presses the button to trigger the alert then the content changes on all the services to the emergency warning. What's important to note is that the services remain the same in all other respects – it's the audio and video content that is replaced.

DTT Early Warning Regionalization



The actual warning message itself is a standard TV channel so it can provide whatever content the disaster coordination agency requires, be that live video or a graphic, with/without audio.

One of the key advantages of working with DTT networks is that operators can regionalize any warnings to prevent unnecessary alarm in unaffected areas. DTT regional insertion has to be bit-accurate in a SFN (single frequency network - widely deployed today for spectrum efficiency) to avoid interference. If a network operator has two DTT content insertion devices at different regional transmitter locations and provides the same input they must get exactly the same output – deterministic technology.

In summary: the emergency service is inserted at transmitter sites; transmitter sites can be 'grouped' so that warnings can be broadcast on a regional basis; viewers in the addressed region will receive the REWS service with normal TV services interrupted; viewers in other parts of the country will continue to receive normal TV services.

While there is, of course, a cost to placing the REWS technology with local insertion units at transmitter sites, it's minimal compared to the potential loss of life that can be prevented when people receive warnings so they can take the necessary actions.

The whole point of an early warning system is that it has to reach as many people as possible who are likely to be affected, at the same time and as quickly as possible. Broadcast REWS is just one of several technologies that can be used, others include radio, mobile phones to location-based claxons have a key role. Broadcast terrestrial TV and REWS has a key role to play in saving lives in the event of any future natural disasters.

Thailand is the first country where we have successfully installed the REWS.

Security Review

Harmonized Security Framework

Lindsay Holman, Chair CM-SEG

In the years since its inception, DVB has produced a significant number of technology specifications, an increasing number of which incorporate security related elements. These specifications were written by DVB sub-groups' members that are experts in the specific technology they address, but may not always have sufficient security expertise. In early 2005, the Security Experts Group (CM-SEG) started work on creating a document that would, for the first time, establish a harmonized, overarching commercial framework for security within DVB. Two years later, in 2007, the Harmonized Security Framework (HSF) was approved and published for internal DVB use. The goal of the document is to guide other DVB sub-groups with respect to general security technologies and protection of audio-visual content, ensuring that security is properly taken into account from the very beginning.

Since the publication of the HSF in 2007, the digital landscape has moved away from the traditional single broadcaster/single TV receiver and recorder model to a far more complex world where the consumer routinely enjoys the benefits of multiple broadcast receive options (cable, satellite and terrestrial), managed delivery over fixed line (xDSL) and internet based OTT delivery channels to access content on a very wide range of devices including smartphone, tablet, PC, Smart TV and Personal Video recorders. In addition, an ever-increasing percentage of content is also consumed in High Definition and this will be enhanced very soon with the advent of Ultra High Definition.

In this changing environment the number, nature and complexity of security requirements across the full spectrum of DVB based applications have increased dramatically.

In order to address these new security challenges, CM-SEG was tasked by DVB with a revision of the HSF. A much wider view has been taken, examining security issues that affect the work and output of the various DVB sub-groups in terms of the total end-to-end content delivery ecosystem.

In this respect, the needs of the content providers are addressed, along with all aspects of the end-to-end content delivery process, including content preparation services, distribution and delivery networks, the wide variety of end-user devices, displays and controllers, and the technical-legal infrastructure that gives content owners sufficient 'trust' in the ecosystem to allow their (increasingly premium quality) content to be transmitted to the consumer. The expanded and revised HSF also takes account of issues relating to privacy, data protection and system integrity.

There are benefits to be obtained from creating or adopting standards in security systems but the candidates for standardization must be chosen carefully in order not to jeopardize the integrity and renewability of the system. The extent of standardization in security systems must also be carefully considered. As a general principle, using a fully standardized security system solution may lead to weaker security and may not fully serve the complex and developing business needs for a service.

The ability to achieve consistency across DVB security solutions is very important, as a set of perfectly secure individual specifications does not automatically guarantee a fully secure overall system. Moreover, DVB security solutions have to be commercially viable, and the strength of a DVB security solution has to be appropriate for the level and nature of threats as they are known and understood at the time of definition.

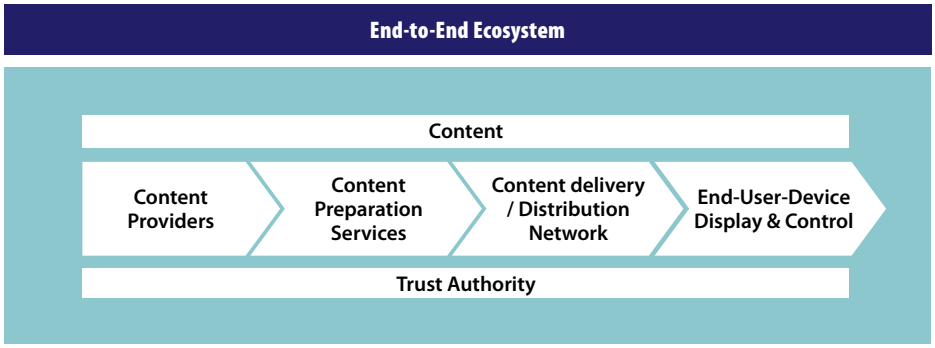
Lindsay Holman has worked as an independent technology consultant since 2005. Prior to this, he was Director of Panasonic's European R&D Centre for Audiovisual & Communications technologies, and has over 35 years of industry experience. He has been involved in security and digital rights management activities within DVB since 2006 and continues to represent Panasonic in these technology areas.

The HSF provides the guiding principles that DVB sub-groups need to follow as they define commercial requirements and approve technical solutions for their own target markets and business models, in so doing, helping to support harmonization between security related requirements across the many different working areas of DVB.

The HSF does not set out to 'predefine' specific security requirements for a given DVB specification. Instead, the HSF guidelines are crafted to ensure that all aspects of security are taken into consideration from the very beginning, that overriding considerations of DVB security systems are taken into account, and that requirements across different DVB specifications are as consistent as possible.

Applied in this manner, and bearing in mind the business context in which commercial and technical requirements are being developed, the HSF should be used in the process of developing new specifications in order to ensure that all security threats known to DVB are addressed in an appropriate manner and that security measures outlined in commercial and technical requirements will reflect a consistent framework that will ultimately ensure a greater level of interoperability.

The increasing pace of change of the digital landscape and the ever-changing nature of security threats and requirements means that the HSF document will continue to be subject to regular review, in order to ensure its continuing utility and value as part of the overall DVB technology 'toolset'.



MARKET WATCH

www.neotion.com

Neotion's new DVBeacon is a cost effective OTT Gateway for satellite operators, delivering DRM protected HTTP Live Streaming (HLS IP streaming services to different screens, adding OTT Services and 4k content to existing pay TV pure broadcast equipment. HLS streaming and end-to-end DRM enable the addressing of any mobile screen individually, solving Quality of Service issues on WLAN, decoding performance and security on devices.

www.newtec.eu

The Newtec MDM6100 Broadcast Satellite Modem R2.6 is the next generation modem, modulator and demodulator (DVB-S; DVB-DSNG; DVB-S2, DVB-S2X). As a modulator it is best suited for DTH, primary distribution to head-ends and contribution of television and radio content. It features the enhanced Automated Equalink predistortion technology, which provides up to 10 percent bandwidth gains in DTH applications. Clean Channel Technology with DVB-S2X further improves satellite efficiency by up to 15 percent.

www.rohde-schwarz.com

The new R&S CLGD DOCSIS Cable Load Generator from Rohde & Schwarz simulates a fully loaded cable TV network upstream and downstream. In the downstream it generates up to 160 DVB-C channels and up to eight DOCSIS 3.1 channels. The signals can be freely combined, allowing users to simulate any conceivable channel loading scenario in the lab. It is a versatile multichannel signal generator for testing tuners, amplifiers, converters and CMTS upstream receivers.

www.harmonicinc.com

The next generation of Harmonic's Electra product line, the Electra X family of advanced media processors, are claimed to be the world's first encoders to support graphics, branding, playout functionalities, and full-frame Ultra HD live 2160p60 encoding, transforming broadcast and multiscreen content delivery. Powered by the company's PURE Compression Engine, these appliance-based media processors boost video compression efficiency across an extensive range of formats and codecs, including HEVC, ensuring superior quality video at minimum bandwidth.

www.work-microwave.de

WORK Microwave's DVB Satellite Broadcast Modulator supports a wide range of DTH broadcast, video contribution, and distribution applications over satellite. Through an advanced feature set, the modulator helps operators get the most out of expensive satellite bandwidth, optimize data transport, and dramatically improve satellite signal quality. Innovative features include Predistortion, Carrier ID, DVB-S2 multistream, TSoIP, and Wideband (up to 80Mbaud). In addition, the modulator platform supports next-generation DVB-S2, providing operators with a future-proof solution.

www.s3group.tv

S3 Group's StormTest Warning Center is a video service monitoring and validation platform for live networks. It's designed to proactively test and monitor, in real-time, the availability and stability of video services. It does this by providing continuous feedback from the live network on the status of services including: linear TV, VoD, EPG, and interactive menus for a range of devices including set-top boxes, android mobile devices, iOS mobile devices, connected TVs and game consoles.

www.roverinstruments.com

ROVER has added new functions to its HD TAB 9 Tablet analyzer. With its easy to use 9"TFT touch screen and its exclusive icon operating system, it is designed to measure all DVB standards (DVBS/S2, DVB-T/T2/LITE, DVB-C/C2) and soon DVB-S2X. New features allow remote monitoring and active probing in the company's network management system including RF measurements, TS analyzer with thumbnails, and White Space analysis. The company has also launched a new fiber optic professional transmitter.

www.teamcast.com

TeamCast's new JUPITER OEM Satellite Demodulator board targets demanding professional applications, with dual on-board DVB-S/S2 demodulation and support of the full set of DVB-S/S2 features. It also offers VCM (multi-stream) and ACM modes, as well as DVB-S2X low roll-off values down to 5 percent and CID extraction. Its low power design, its on-board CPU and easy-to-use API, make its integration into professional IRDs quick and straightforward.

www.gatesair.com

GatesAir's new Maxiva Ultra-Compact series, is a standalone low-power translator and on-channel gap filler for UHF and High Band VHF stations across four power levels (30, 50, 80 and 130 watts). It cuts the rack space requirements of its predecessor by 50 percent, delivering a broadband 1RU solution with exceptional performance and efficiency. The series balances exceptional over-the-air quality with a green, cost-reducing architecture that slashes energy consumption, power bills and maintenance.

www.verimatrix.com

The Verimatrix Video Content Authority System (VCAS) for Broadcast-Hybrid is a multi-network revenue security solution that enables combinations of RF and multicast linear delivery with advanced adaptive bitrate streaming video services, while ensuring harmonized rights management for subscribers both at home and on the go. The solution is ideal for cable operators delivering a mix of RF and IP video services while wishing to migrate towards an all-IP delivery paradigm.

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