DVB Native IP webinar

Q&A follow-up

Answers provided by the webinar presenters.

Question	**Answer**
Acknowledging, the statement of increased linear TV watching during the pandemic, the tendency of moving linear channels to an OTT silo seems to gain momentum; latest today with Disney announcing the close of 100 international TV channels (Fox, Nat Geo etc…) by the end of the year moving them to Disney+, how do you envision the presented DVB ecosystem with support for native IP supporting this trend?	As briefly introduced in slide #9, there is a trend that shows resilience of linear TV viewing even if there is a debate among market analysts about how much on-demand viewing will cannibalize linear TV viewing. The links in slide #9 provide interesting data points and viewing angles in this regard, and one point worth noting is that Native IP over Broadcast networks is a highly efficient mean of delivering LIVE content - such live content may be part of linear TV channels, or may be delivered as separate independent events, this being made possible by dynamic allocation of time slots in a given transponder or transmitter space, the spare time being used for pushing on-demand content ...
How does the return path work? is it Sat or any type of IP ?	Native IP works for one-way or two-way broadcast delivery. When available, the return path may be of any form (satellite in case of VSAT, as well as terrestrial such as mobile, fiber, DSL, WiFi, etc…) - this depends on the features of the consumer device used to access the content.
Already now, with MPE it is possible to transmit IP over a broadcast delivery system. What is the added advantage of NIP ?	Indeed, and it's how the Astro SINI service is delivered right now in Malaysia. However, there are missing pieces in the DVB toolbox such as a relevant signalling method to describe the network and the content, and we are also missing specs in relation to using GSE as the preferred link layer (which is more efficient than MPE) - and with GSE the DVB-SI signalling tables as they exist today cannot really be used (you are missing at least a bootstrap mechanism). Content protection which will leverage DRM is also to be addressed especially in the case of truly one-way broadcast distribution where retrieval of DRM licences is made impossible. We expect NIP to be mainly a set of implementation guidelines pointing to DVB-DASH, DVB-MABR, DVB-GSE and DVB-MPE with some complements where gaps have been identified. In addition, its integration with DVB-I Service Discovery will also add value, making NIP services easily discoverable, when available, for instance, as a replacement of unicast services (in this way offloading the broadband connection).
is this roaming scenario from 4G to Boadcast in the car similar to the ATSC use cases ?	Yes, it's mostly the same than the ATSC3.0 use case

How is Packet loss handled ? in case the broadband has interferences?	It is expected that the packet-loss rate will be similar to broadcast (DTH or DTT), so fairly high performance. However, in case of packet loss and where a broadband connection is available, then the missing packet(s) or should we say video segment(s) may be requested to the origin server and delivered in unicast (e.g. http retry).
How is delay handled ? Broadband vs Broadcast ?	Because we rely on the performance of a broadcast distribution network like for regular DTH or DTT, latency is predictable, so DASH segments can be made of very short duration. Low-latency DASH is also an option to optimise the overall network performance, so in the end we believe Native IP can be more or less on-par with legacy broadcast.
How many DASH profiles are transmitted? Any given time?	It is expected that only one layer should be transmitted (so the "OTT" source format won't be adaptive), unless the service provider would want to address different category of consumer devices (large screens versus small screens) and/or different QoS in relation to eg the redistribution of the content over WiFi.
I have a question to the overall service quality: How can one guarantee an adequate video/audio sync when using a broadband delivered audio with a broadcast video. What hardware-buffer needs the receiving device to provide? I currently "suffer" from disastrous audio/video-NONsync.... on the broadband alone...	Usually, all representations (video profile(s) and audio and subtitling tracks) of a media stream or asset will be delivered using DVB-DASH hence using the sync mechanisms defined in DASH. If two different delivery networks are used (video over broadcast, audio over broadband), the key point is the difference of delay which requires at the receiver side a mechanism to ensure the reception of the related audio and videos segments available simultaneously on both networks. NB: your audio/video desynchronisation is probably due to bad timing information on the broadband content (but not link to the network)
Is there foreseen terrestrial IP native group in the DVB?	In short, yes, there will be a Native IP solution for terrestrial. This is true that it has mainly been triggered by the satellite stakeholders - which explains why most of the commercial requirements (not all) build on satellite use cases, and why those are currently being addressed in a technical working group chaired by satellite companies. However, such a standard also draws some interest from terrestrial stakeholders, even if the need falls within a longer-term vision. This is one of the reasons why the technical work is undertaken in a way that makes the solution also eligible for terrestrial networks. The second reason is that DVB always made its solutions modular and flexible, thus, as network-agnostic as possible. And, as obvsiously mentioned in slides #6 and especially #7, DVB is defining the interfaces (thanks to DVB-I service discovery, offering harmonized metadata) that will allow end users to access services in a seamless way, no matter where they come from, so there is no reason why terrestrial networks should not be included in the Native IP solution!

What about reception on handsets when on the move? Mobile data would have to be used?	Reception with handsets when on the move in an area covered by the service typically served by WiFi, such as in train stations, shopping malls, universities and hospitalities, etc… is possible - This assumes that this place is equipped with a "broadcast to WiFi" solutions similar to the one deployed for the Astro SINI service. Outside such coverage area, where only mobile data plan can be used, then regular OTT streaming will be used.
How the requirment of latency addressed?	Same as question #11 - Because we rely on the performance of a broadcast distribution network like for regular DTH or DTT, latency is predictable, so DASH segments can be made of very short duration. Low-latency DASH is also an option to optimise the overall network performance, so in the end we believe Native IP can be more or less on-par with legacy broadcast.
Just make sure that DVB-I for satelites is still through DVB-S for broadcast, the same for 5G?	DVB-I aims to ensure that linear television delivered OVER THE INTERNET is as user-friendly and robust as a traditional broadcast television experience. Native IP adressses a different purpose which is to deliver live and/or linear TV over broadcast networks. These broadcast networks can be used for contribution or distribution.
Discussion about converging Broadcast with Broadband e.g. mobile networks takes place for years since DVB-H in 2004, but no convergence happened. What new standards will improve chances this convergence to happen?	Native IP, together with DVB-I, are the missing buildin blocks that will enable the true convergence of broadcast and fixed broadband. Whereas HbbTV bridges broadcast and broadband but maintains two different ecosystems for content preparation (content formats), by adopting a Native IP file-based media format, content providers will be able to converge on a single content preparation infrastructure regardless of the distribution channel (and DVB-I will allow the resulting services to be seamlessly retrieved either from broadcast or broadband networks). Likewise, the media player devices won't need to support the legacy MPEG-TS/MPEG-PES video packaging format anymore. Convergence with mobile broadband will take more time. DVB-H just wasn't adopted by operators. Also the sad fact is that mobile devices that allowed linear broadcast reception flopped in most markets. A convergence based on new features (targeted advertising and others) could happen via satellite/terrestrial with Native IP (and DVB-I and 5G broadcast respectively). The crucial element will be whether operators embrace these technical possibilities and which one they prefer respectively.
What is the main difference between the ATSC 3.0 and the Native IP? Is there some parts in ATSC 3.0 that may be re-used in DVB NIP	ATSC 3.0 implements a Link Layer protocol called ALP that is mapped onto the ATSC 3.0 OFDMA RF modulation whereas DVB will leverage GSE which has applications for all DVB modulations - Also ALP is IPv4 only whereas NIP will be IPv4 and v6 - Last point, signalling will leverage what is already available in the DVB toolbox (e.g. parts of DVB-I) whereas ATSC3.0 defined a complete new set of signaling (LLS/SLT, SLS...)

Being in Mobile operator shoes with same standard all over the world, asking for convergence with TV broadcast having so many different standards would scare me. Is there any progress on global TV standards, as mentioned by Mr Faria years ago?	A good point. There are however also still different mobile standards in use (US, Japan) and ofter devices are not compatible with the band different 4G/5G bands. So the issue sort of remains. For known reasons the world is unfortunately divided in (competing) regional broadcast standards, both on satellite and terrestrial. Native IP must become a worldwide standard to be successful - on satellite or terrestrial.