

GLOBO SHOWCASES NEXT GENERATION TV TECHNOLOGY FOR FIFA WORLD CUP QATAR 2022™ MATCHES

- Globo organizes live showcase in preparation for Brazil's forthcoming TV 3.0 system
- Technology companies add TV 2.5 and TV 3.0 technologies to their products signalling growing ecosystem support
- The trials are a world first for the combination of VVC Video, MPEG-H Audio and MPEG-5 LCEVC, for live DASH streaming

Sao Paulo, Brazil – 21 November 2022 – [Globo](#), the Brazilian mediatech company, announces two showcases to demonstrate to partners, guests and Globo employees, at a Globo-venue in Rio de Janeiro, the evolution of Digital Terrestrial Television (DTT) in Brazil during the FIFA World Cup Qatar 2022 transmissions. Globo will broadcast and live stream every match of the tournament using backward compatible improvements from the current TV 2.5 standard and preliminary specifications for TV 3.0, the country's next-generation DTT system, specified by the Brazilian [SBTVD](#) Forum. Both showcases represent a significant technological step towards a better viewing experience. Namely the demonstration of the TV 3.0 system, which is intended to facilitate the distribution of current and future formats, includes 8K resolution, High-Dynamic Range (HDR), and Next-Generation Audio (NGA) to over-the-air broadcast (OTA) and over-the-top (OTT) streaming platforms upon its development in the next coming years.

“Globo is committed to the evolution of TV in Brazil, and we are excited to work with all media partners to drive the growth of the technological ecosystem that clears a path towards Brazil TV 3.0. This pioneering project not only shows the bright future of broadcasting but also demonstrates the commitment of its partners and helps to educate the Brazilian broadcast technology community as we get closer to TV 3.0 Project goals led by the SBTVD Forum. Furthermore, it allows viewers the best live coverage quality FIFA World Cup Qatar 2022 matches achievable using TV 3.0 technologies. This is a world's first, thanks to the effort and dedication of partners like Fraunhofer IIS and V-Nova,” said Carlos Cosme, Innovation Specialist at Globo

The first showcase explores new technologies that have already been selected for the next generation of DTT: H.266 Versatile Video Coding (MPEG-I, VVC), MPEG-H Audio, Low Complexity Enhancement Video Coding (MPEG-5, LCEVC), and Dynamic Adaptive Streaming over HTTP (DASH). It is the first time these technologies are being used in a complete end-to-end live production, to provide 4K HDR video with immersive and personalized audio. It illustrates the fast pace at which these technologies are maturing, while they are implemented in both hardware and software solutions.

This showcase (TV 3.0) was made possible by the cooperation between SBTVD Forum members (Ateme, Fraunhofer IIS, Globo, V-Nova) and their partners (MediaTek, Neumann/Sennheiser, Spin Digital and Telos Alliance). It will feature the first TV supporting VVC, LCEVC, and MPEG-H Audio, as well as a complete user interface for viewers to interact with the content while experiencing the immersive sound over a Sennheiser AMBEO Plus soundbar. A theatre-like setup will be used to reproduce the immersive production from Qatar at the Globo-venue in Rio de Janeiro, where partners, VIP guests and Globo employees will feel like being right in the action in Qatar. The home theatre installation includes a 5.1+4H loudspeaker setup provided by Neumann/Sennheiser and a 4K HDR Beamer provided by Samsung.

Mickaël Raulet, CTO at Ateme, commented, “TV 3.0 is driving the market toward converged broadcast and OTT delivery models. This technology harnesses the flexibility brought by

OTT, including multiscreen and personalized ads or services. Coupled with Ateme's powerful encoding that delivers pristine images and immersive, personalized audio, it enables broadcasters in Brazil to boost audience engagement and get new revenue streams. We're excited to be part of this journey with the Brazilian market."

Bernhard Grill, Director of Fraunhofer IIS, highlighted, "This is a very significant project for all of us since it unites so many different media technology thought leaders. After many years of trustful cooperation with our partners from Globo, this event marks a highlight and is a giant step in the evolution of Brazilian broadcast. We are very proud to be part of it. In return this will help accelerate the adoption of MPEG-H Audio in consumer devices worldwide. We look forward to this major global TV event, where the MPEG-H Audio system will be used in production within both standards: TV 2.5 over the existing terrestrial system, but also in TV 3.0 where MPEG-H Audio is the sole mandatory audio system."

Alfred Chan, Vice President of TV BU, Smart Home Business Group at MediaTek comments that, "For receiving of the DASH stream, MediaTek has provided the Pentonic 1000, its latest flagship smart TV system-on-chip (SoC) designed for 4K 120 Hz displays, supporting the VVC (H.266) standard and MPEG-H Audio playback as well as HDMI passthrough. We designed the MediaTek Pentonic 1000 specifically to accommodate today's smart TV trends, including 4K streaming, immersive and interactive sound. With support for cutting-edge codecs like VVC and MPEG-H Audio, Pentonic 1000 will deliver the ultimate 4K viewing experience for Brazil's TV 3.0 next generation standard."

The second showcase (TV 2.5) explores new technologies that can be used with the current over-the-air system (known as ISDB-Tb) in a way that is backward compatible with legacy receivers (which are full-HD, interlaced, and 8-bit SDR) while enabling new features in new receivers. It will use a live OTA transmission to showcase three major enhancements of the existing DTT system:

- Broadcast-Broadband Integration: using DTVPlay, the new software framework available in Brazilians TV sets, to provide a multiscreen experience named as Social TV application
- Immersive and Personalized Audio: using MPEG-H Audio to provide a personalized sound experience containing a 5.1+4H immersive mix, alternative commentary options, enhanced kick ball and fans cheering sounds from arenas, among other audio objects for the user to select
- Enhanced Video Quality: MPEG-5 LCEVC to provide a backward compatible HDR10 and Advanced HDR by Technicolor video at 1080p / 59.94 fps / 10-bit video enhancement layer over the existing AVC/H.264 base

Thorsten Schumann, Senior Vice President Engineering, MainConcept, emphasized, "TV 2.5 codifies the first major shift to how Brazilians watch TV since 2007 and represents the jumping off point for future advancements. The underlying video codec used in the TV 2.5 trials, the MainConcept AVC/H.264 SDK, has been the workhorse supporting major broadcast workflows around the world for almost two decades. Thanks to the collaboration with Globo, V-Nova, InterDigital and Fraunhofer IIS, and the addition of LCEVC enhancements and MPEG-H Audio, Brazilian consumers will benefit from improved video quality, including HDR, without any impact to the legacy devices."

Guido Meardi, CEO, V-Nova said, "We are extremely proud to be a member of SBTVD Forum and part of this project with Globo. SBTVD Forum is leading the way in the convergence of broadcast and broadband TV and in deploying the best video and audio technologies to improve the quality of media and entertainment in people's homes. The Globo trials tangibly demonstrate the benefits of LCEVC in these systems. In the current TV

2.5 system, LCEVC adds a retro compatible HDR enhancement to the current digital terrestrial signal. In the upcoming TV3.0 system LCEVC enhances VVC to provide the lowest bandwidth possible for a 4Kp60 UHD TV signal. The work done with Globo and our partners to demonstrate these capabilities live and on-air, shows the growing ecosystem support for LCEVC and the feasibility of the roll out of this technology.”

This showcase includes technologies from the current Brazil TV 2.5 specification, as well as LCEVC, which is under consideration for inclusion by the SBTVD Forum.

This showcase was made possible by the cooperation between SBTVD Forum members (Fraunhofer IIS, Globo, Hitachi Kokusai Linear, InterDigital, Philips, V-Nova) and their partners (Cobalt Digital, MainConcept, and VBox Communications), which helps to increase the technology ecosystem of our media industry.

The Globo showcases will run live during all FIFA World Cup Qatar 2022 matches from 20 November to 18 December 2022.

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About Globo:

Latin America’s largest media company, Globo, brings together free-to-air and pay TV channels, in addition to digital products and services. Its linear channels speak to more than 100 million people in Brazil every day. And, thanks to its wide network of partner affiliates that covers the entire country, it is able to be local, regional and national at the same time. In 2018 it started its digital transformation journey, becoming a mediatech company, strongly supported by technology and focused on direct relationships with consumers. It provides audiences a complete viewing experience, which combines the ability to produce high quality content with technological expertise, with distribution on various platforms, such as TV Globo, a free-to-air TV channel; its 26 pay TV channels; its SVOD and streaming platform Globoplay; and digital products: news G1; sports GE.globo; and entertainment Gshow, among others.

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