

Unlocking OTT:

THE CRUCIAL ROLE OF HEVC IN STREAMING TECHNOLOGY

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THOUGH WE DON'T OFTEN THINK ABOUT THEM, VIDEO CODECS ARE A FOUNDATIONAL COMPONENT OF VIDEO TECHNOLOGY, UNDERPINNING ALL TELEVISION AND MEDIA CONSUMPTION. AS TELEVISION EVOLVES IN FRONT OF OUR EYES, FROM LINEAR BROADCAST CONTENT TO OTT STREAMING MODELS, SO TOO ARE CODECS EVOLVING TO MEET OUR NEEDS.

The video media industry is in the midst of a standards evolution where HEVC, or H.265, is becoming the dominant video codec, with incredible promise for the ecosystem. HEVC's dominance follows on the reign of AVC, or H.264, which served as the primary codec for many years and remains a bread-and-butter codec for its large installed base.

Still, industry is trending in favour of HEVC due to its superior performance in terms of improved compression, inherent bitstream reduction, and its support for UHD, and many in the industry predict HEVC will be the codec of choice in the coming years.

WHY HEVC?

When AVC was rolled out, it supported the introduction of high-definition television, which represented a significant innovation in television consumption. At the time, HD resolution was still interlaced with standard dynamic range (SDR) and standard frame rates, and industry hadn't yet experienced the 1080p, 4K resolution or 60 frames per second (fps) quality content we have today.

When HEVC was introduced, its compression algorithms brought bandwidth down to reasonable levels and became the first codec where 4K resolution content was realistic and achievable. HEVC also introduced high dynamic range (HDR), wide colour gamut (WCG), and support for higher frame rate content from 60 up to 120fps, which combined to empower more life-like picture quality. With HEVC, video picture quality became sharper, colours richer and dynamic range and frames per second increased to make content like live sports appear more precise.

Still, new features alone are not enough to warrant a new codec; new codecs are also critical to achieve lower bitrates. For example, enhancing your television resolution from 1080p to 4K increases the pixel use from roughly 2 million to 8 million pixels, a transition that requires four times more data. To deliver this density of data, in addition to new media features, new codecs like HEVC are needed.

For over-the-top (OTT) streamed content in particular, the improvements brought by HEVC have been an essential contributor to the growth of streaming. HEVC's progressive framerates and ability to reduce bandwidth enables it to deliver broadcast or better-quality experiences to streaming audiences, supporting many content styles such as artistic film content that is heavy in

dark shadows, outdoor content with brightly lit natural scenes, animated content with highly saturated colours, as well as fast-moving sports content.

In addition to its benefits for streaming, HEVC remains a critical part of existing broadcast tech. At the start of 2024, France Television officially launched its France 2 service in 4K HDR over the terrestrial network. Over the summer, French soccer fans with HDR-equipped TVs were invited to experience the UEFA Euro 2024 tournament in a HD-HDR broadcast provided by M6 on Canal 56, a dedicated digital terrestrial channel. The viewers streamed HDR content throughout the tournament, and HEVC ensured there was no perceived difference in the delivery and quality of video content.

BROADCAST VS. STREAMING

Streaming has overtaken broadcast as the delivery method of choice for many consumers around the world. In the US, for example, streaming has become the #1 viewing method, where many streaming services are delivered over cable. This trend is likely to continue as technology evolves and new device types, like head mounted displays and immersive devices, proliferate and deliver new types of experiences. As such, codecs will continue to evolve to meet the challenges of this exciting future.

In the traditional broadcast model, one service is delivered to a broad swath of audience members. This means that the codec chosen by the broadcaster must be supported by every device, otherwise devices without that codec cannot receive content.

The approach is somewhat different for OTT streaming, because different codecs can be offered by the streaming provider, and the most optimal codec may then be selected based on the TV being used. For example, if a TV supports both HEVC and AVC, it can examine the DASH manifest to determine whether an HEVC stream is available, and if not, it can request an AVC stream instead.

Compared to broadcast, OTT streaming creates more flexibility for new codecs to be introduced, but HEVC is a codec that can be used in either scenario. In fact, a recent Futuresource report found that nearly all TV sets, and more than 96% of consumer video products sold today, support HEVC.



BEYOND TV

Video consumption extends beyond just TVs, and it is estimated that roughly 80 percent of all consumer internet traffic today is comprised of video data and a significant portion of that comes from mobile devices. Once a device used just for calls, today's smartphones are equipped for users to stream movies, TV, sports, social media, and more. For this reason, video codecs are designed to support a range of smartphones, tablets and smaller-screen devices, and to run efficiently on battery-powered mobile devices.

At the end of the day, the benefits offered by advanced codecs are only good as the end-user devices that leverage them, and there are a variety of mobile devices that include support for HEVC today. For example, Google added support for HEVC video decoding in its Chrome web browser, which mirrors Apple's continued support for HEVC in Safari. Many new devices on the market are built to support multiple codecs, in large part to accommodate the shift from broadcast to streaming.

These new UHD features, advances in video compression efficiency, and contributions to the growth of high-quality streaming were largely made possible by HEVC. Codecs are foundational and the work being done in standards bodies like MPEG and ITU-T, and industry groups like SCTE, ATSC, DVB, and SBTVD are vital to the growth and innovation of our ecosystem. InterDigital continues to be a steadfast contributor to these standards groups and organisations. We collaborate closely with industry partners to ensure state-of-the-art codecs and technologies can be commercially deployed to the benefit of both industry and consumers for the future we are building together.