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Compression

Compression (noun) is the act of making a computer file use less space when it is stored, using special software.¹ I started my career in compression with some of my technology ending up in the Motion Picture Experts Group (MPEG)-2 standard through my French employer. At that time, we were fighting against the limitations of semiconductor physics to get enough processing and memory to do a good job. Today, we have limitless processing and limitless storage, and anything you can think of can be done with software. Unfortunately, there is no unlimited amount of money, nor is there an unlimited amount of power that can be deployed in every application. Compression still serves us well to reduce storage and network bandwidth as well as match the content's representation to the application requirements.

SMPTE has six compression standards (Video Codec) VC-1 to VC-6 that are available in the store. They have different application areas and serve different communities. Recently, the team

¹dictionary.cambridge.org

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responsible for VC-2 has revised it to add hybrid log gamma (HLG) support to the codec. While doing so, they improved the conformance code by analyzing the VC-2 standard, created a pseudo-code variant of the document, and cross-checked that pseudo-code against the conformance code to ensure that they never diverge. This looks like a very promising way of validating SMPTE compression standards.

The VC-3 team is also active and is currently adding alpha channel support to various SMPTE documents. The VC-5 team is updating its conformance tools to match the recent metadata updates that have been standardized. VC-6 is the newest addition to the SMPTE compression family and has recently appeared in the digital library as the first of our standards to feature neural network-based upscalers.

We must not forget the audio, and one key part of all compression systems is metadata. SMPTE has a process called the *Public Committee Draft* by which documents are field-tested. You can find the list of documents on the SMPTE website at <https://www.smpte.org/public-committee-drafts>. At the time this *Journal* is published, you will see that SMPTE ST 377-4

and ST 377-41 too are on the list. This is particularly important as the levels of automation in distribution increase. Once upon a time, there might have been a human being who was checking that a particular audio pair was German Stereo Audio for the hearing impaired, but today, it is more likely to be software making that decision. By publishing the upstream mechanisms for signaling those sound fields, we improve the chances of that metadata and the corresponding audio making it to the playout server or origin server or headend or wherever it needs to get.

Compression has been the key to changing the economics of the media industry. We have different, special compression systems for various applications, but metadata is the key requirement for good, automated performance. SMPTE's new and ongoing work in compression, metadata, and transport brings all of these specialties together in the one organization that can make a big difference on the international stage. Our next meeting in September will be virtual, so if you have never been to a standards meeting, then you have nothing to fear. It is free for first timers. Please get in touch if you would like to know more.