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Compression

We live in an era where bandwidth and compute power are cheap. Curiously, though, bandwidth and compute power are not growing at the same rate, which means that we can manage costs by exchanging bandwidth resources for compute resources through the use of compression. When MPEG-2 was created, the designers had a fairly clear idea of the memory footprint and chip area, which was reasonable. In 2018, we have a range of different techniques and methodologies for compression that are adapted to different specific needs. Low-latency compression for interactive applications will be optimized differently to multipass offline encoding for scripted content to be consumed on-demand.

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So what is SMPTE doing in compression? It all began with VC-1 (ST 421), when Microsoft decided to standardize their Windows Media Video 9 bitstream. A successful outcome then led to VC-2 (ST 2042), developed by the BBC and also known as Dirac. The third codec in the SMPTE suite, VC-3 (ST 2019), was proposed by AVID and often called DNxHD. VC-4 (ST 2059) is subtly different in that it is an enhancement layer to the MPEG family of codecs to deliver an enhanced quality as well as enhanced fidelity in bit depth, resolution, and color difference. VC-5 (ST 2073), also known as the GoPro Cineform codec, is just reaching the end of the standardization process. VC-6 (ST 2117), known as Perseus, is at the beginning of its standardization activities, and the committee welcomes all compression experts to take part in the document development process. We shouldn't forget that there are also many documents that constrain codecs in the SMPTE digital library along with Registered Disclosure documents that define codecs such as RDD 36 (ProRes).

A compression algorithm is only part of the story. The bitstream needs to be carried in file formats such as ISO MP4 and MXF. Compression formats need to be mapped into transmission formats such as Transport Streams and IP packets. Devices need to be tested and so compression proponents provide test streams, test images, and reference decoders, which are all available either in the SMPTE Store or within the standards community.

Overall, SMPTE's activities in the compression domain are very healthy. If you want to hear what is going on, why not join one of the SMPTE standards webcasts that take place four times a year. We keep it interesting to help you engage with the technology. SMPTE

UPCOMING TECHNOLOGY COMMITTEE (TC) MEETINGS

3–6 December
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