

VC-2 / Dirac / SMPTE ST-2042

Q and A

V2 2015_04_13

What is the history of the VC-2 compression system?

The BBC looked at their own future requirements and existing compression systems. They identified key criteria that they needed from a compression system which they were unable to find and so developed Dirac, now internationally referred to as VC-2 and embodied in the SMPTE ST-2042 specification.

4k SDI to 10G Ethernet would need a low latency simple codec with 2:1 or 4:1 compression. Does VC-2 / Dirac fit the bill?

VC-2 is one of the lowest delay codecs available and comfortably attains low compression rates of between 1 and 8

Do you have a recommended profile for this?

VC-2 HQ profile, 2 or 3 level Haar with single shift.

How many LUTs/Registers are needed for an implementation for example in a Xilinx Kintex7/Arria5 or other hardware?

The encoder uses between 150k to 200k gates (approximately 12,000 slices and 18,000 LUTs)

The decoder is a little smaller than this.

Memory requirements for 4K are about 1.5Mbit for the encoder and 2Mbit for the decoder

Does the codec need external memory?

No, see above

How many video lines delay is necessary for the coder/decoder for 3G-SDI signal?

The encoder and decoder each have a little over 5 lines of delay making a codec delay of just over 10 lines for a 2-level Haar implementation.

Do we need a 4:4:4 color scheme or can we use the 4:2:2 color scheme for 3G-SDI?

No, 4:2:2 is preferred although VC-2 can work with 4:4:4

Will the VC-2 packets be used in a SMPTE2022-6 stream or SMPTE2022-2 stream?

VC-2 can work with both.

SMPTE2022-2 has less overhead. Of course VC-2 can be mapped directly onto SDI as well, hence SMPTE2022-6 works too. When encapsulated on SDI, a viewable picture is placed in the two msbs and this allows the picture to be viewed directly using a conventional SDI video monitor, although noisy and coarsely quantized!

In their work BBC R&D are working with two industry bodies in particular, who are the EBU Joint Task Force on Networked Media (<https://tech.ebu.ch/jtnm>), initiated by the EBU, SMPTE and the VSF, and also with the Video Services Forum directly (<http://www.videoservicesforum.org/index.shtml>)

Do you have a price model on licenses to use your IP?

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One price model we have used is as follows:

NRE customization

Cost Compression Codec

Cost Decompression Codec

Cost per core Compression

Cost per core Decompression

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