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INTERNATIONAL ORGANIZATION FOR STANDARDIZATION
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Video compression better than VVC possible

The 152nd MPEG meeting was held at Geneve, CH 7 –11 Oct. 2025

At its 152nd meeting, MPEG promoted **four standards** to **Final Draft International Standard (FDIS)**, and two standard to Final Amendment (FDAM), driving innovation in JVET, Graphics coding, and Systems, respectively:

- Fourth edition of VSEI
- Fourth edition of VVC
- Seventh edition of HEVC
- MPEG-I pt 5 V3C and V-PCC
- Low-overhead Image File Format
- New Structural CMAF Brand Profile

At its 39th meeting in July 2025, JVET (SC 29 WG 5) had issued a Joint Call for Evidence (CfE, on behalf of its SC 29 and ITU-T SG21 parent bodies) as a public document. The CfE requested information regarding the existence of video compression technology that has compression performance, complexity tradeoff or additional functionality beyond that of VVC. In total, 5 responses were received at the 40th meeting in October 2025, originating from 16 companies and research labs. 20 submitted codec configurations were tested (in addition to VVC anchors, VVC encodings with reduced run time, and encodings using JVET's ECM experimental model). Beyond improved compression at large, another focus was on demonstrating compression performance with reduced complexity and fast encoder run time. After extensive subjective viewing of sequences in seven categories (including 8K, user-generated, gaming and high dynamic range content), evidence was found about novel technology with better compression as well as capability for good performance with runtime-constrained encoding, as well as support for functionality such as ultra-low delay and error resilience beyond the capabilities of existing video compression standards. As a next step, it is planned to work towards an open Call for Proposals (CfP) on submission of technology for a next generation video compression standard, to be issued during the next meeting cycles. Based on the assessment of the CfE submissions, both,

further improvements on conventional technology (based on traditional signal processing) as well as technology based on neural networks and artificial intelligence are considered to be interesting in this context.

MPEG finalizes low overhead image file format

At the 152nd MPEG meeting, MPEG Systems (WG 3) promoted the ISO/IEC 23008-12 AMD 2 Low-overhead Image File Format to the final stage of standard development, Final Draft Amendment (FDAM).

The specification for a file format specialized on storing a sequence of images, ISO/IEC 23008-12 Image File Format, also known as High Efficiency Image Format (HEIF), becomes popular swiftly in the market. It has been developed as a variation of industry favorite file format technology, ISO/IEC 14496-12 ISO base media file format (ISOBMFF). Thus, it has embedded challenge of relatively large overhead for very small sized images such as icons, thumbnails, and so on. This amendment has developed to overcome such challenge by introducing marginally non-backward compatible to ISOBMFF. The new brand 'mif3' has been introduced to indicate that the file uses MinimizedImageBox instead of MetaBox and MediaDataBox to reduce the size of overhead. As the legacy parsers would not be able to directly consume such files, the specification also defines the technologies to expand the MinimizedImageBox into the traditional MetaBox and MediaDataBox as well.

MPEG finishes development of CMAF structural brands

At the 152nd MPEG meeting, MPEG Systems (WG 3) promoted the ISO/IEC 23000-19 AMD 2 New Structural CMAF Brand Profile to the final stage of standard development, Final Draft Amendment (FDAM).

The Emmy award winning standard, ISO/IEC 23000-19 Common media application format (CMAF) for segmented media defines various restrictions on the structure of the on-the-wire data for IP-based media streaming service relying on ISO/IEC 14496-12 ISO base media file format (ISOBMFF) standard. To maximize its reusability and compatibility across various applications, the segmented data may only contain the media from a single track of a ISOBMFF file. This amendment relaxes such restriction to allow inclusion of metadata from a metadata track that is directly related to the media data in the segmented data acknowledging the industry requests. In addition, this amendment introduces media profile for Multi-View (MV) HEVC video data to support stereoscopic video.

Next editions of VSEI, VVC, and HEVC finalized

At its 40th meeting, JVET (SC 29 WG 5) finalized work towards the next editions of the following standards, by promoting them to the Final Draft International Standard (FDIS) stage. Twin text versions for all of them have also been submitted to ITU for initiating consent on next editions of the three standards:

- Versatile supplemental enhancement information messages for coded video bitstreams (VSEI, ISO/IEC 23002-7 | ITU-T Rec. H.274),
- Versatile video coding (VVC, ISO/IEC 23090-3 | ITU-T Rec. H.266),
- High efficiency video coding (HEVC, ISO/IEC 23008-2 | ITU-T Rec. H.265).

The main aspect of the new editions is to provide additional definition and support for SEI messages. The new VSEI edition adds the following:

- Extensions and clarifications for the SEI messages on neural network-based post filtering, and film grain characteristics,
- Two new SEI messages indicating recommendations on processing order and nesting of different post processing stages,
- New SEI messages on source picture timing signalling, on signalling of modalities such as infrared or X-ray video, on signalling packing of regions in a video picture, on encoding object masks in auxiliary pictures, and on signalling purposes of encoder optimization applied in a video stream,
- A Set of three new SEI messages supporting the addition and management of digital signatures to video streams, and a set of two new messages enabling to encode human face videos with low amount of data using generative AI,
- New SEI messages on image format metadata, text description, and AI usage restrictions request.

All of the new features mentioned above can be used in video streams following the new VVC edition, and most of them are also supported by the new HEVC edition. Both VVC and HEVC editions also come with some minor clarifications added on top of the main text. The new HEVC edition also contains additional definitions and clarifications regarding the recently added multi-view profiles.

Two 3D Graphics Standards Progressed at the 152nd MPEG Meeting

At the 152nd MPEG meeting held in Geneva in October 2025, significant progress was achieved in the standardization of 3D graphics technologies. Two key standards were promoted within the MPEG-I framework.

MPEG-I Part 5 – Visual Volumetric Video-based Coding (V3C and V-PCC) was advanced to the Final Draft International Standard (FDIS) stage, corresponding to its fourth edition. This new edition introduces substantial updates to the V3C framework, primarily to enable the integration of an additional instance of the V3C bitstream—namely V-DMC (Video-based Dynamic Mesh Compression).

Until now, V3C could be instantiated for V-PCC (Video-based Point Cloud Compression) and MIV (MPEG Immersive Video). The current revision extends its flexibility, allowing V3C to also serve as the structural foundation for V-DMC, thereby reinforcing its role as a generic framework for volumetric video coding. All these instances share a common design principle: the use of conventional video codecs as the compression layer, complemented by other dedicated tools that adapt the system to specific types of 3D content.

While V-PCC remains defined within the same part as V3C for historical reasons—since it was the first implementation of the concept—MIV and V-DMC are specified separately in MPEG-I Parts 12 and 29, respectively. The approval of this edition for FDIS ballot confirms the maturity of the revised architecture and its readiness for publication as an International Standard.

MPEG-I Part 40 – Conformance and Reference Software for Enhanced G-PCC was promoted to the Committee Draft (CD) stage. This new part of the MPEG-I suite provides the conformance methodology and associated reference software for the enhanced edition of the Geometry-based Point Cloud Compression (E-G-PCC) standard, ensuring interoperability and reliable implementation across products and services relying on 3D point cloud technology.

How to contact MPEG and further information

Those who wish to receive MPEG Press Releases by email should contact Kyuheon Kim at kyuheonkim@khu.ac.kr or subscribe at <https://lists.aau.at/mailman/listinfo/mpeg-pr>. Further information can be found on the MPEG Website: <http://www.mpeg.org/>, including the MPEG Roadmap.

Future MPEG meetings are planned as follows:

- No. 152, Geneva with SG 21, 07 – 11 October 2025
- No. 153, Online, 19 – 23 January 2026
- No. 154, Santa Eularia, 27 April – 1 May 2026
- No. 155, Geneva with SG21, 13 July – 17 July 2026

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