# INTERNATIONAL ORGANIZATION FOR STANDARDIZATION

# ORGANISATION INTERNATIONALE DE NORMALISATION

# ISO/IEC/JTC 1/SC 29/WG 11

# CODING OF MOVING PICTURES AND AUDIO

**ISO/IEC JTC 1/SC 29/WG 11 N15066**

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# MPEG H 3D Audio progresses to International Standard

Geneva, CH − The 111th MPEG meeting was held in Geneva, CH, from 16 – 20 February, 2015

**MPEG-H 3D Audio to be published as International Standard**

At the 111th MPEG meeting, MPEG-H 3D Audio progressed to International Standard status. MPEG-H 3D Audio supports a highly immersive audio experience for loudspeakers placed in a 3-dimensional configuration (e.g. high, mid and low for front, side and surround), and supports content in multiple formats: channels (C), channels and objects (C+O), and scene-based Higher Order Ambisonics (HOA). This technology has been evaluated for bitrates between 1.2 Mb/s and 96 kb/s and has shown Good to Excellent performance.

Key functionalities are a compact and bit-efficient representation of immersive, multi-channel audio programs, and the ability to flexibly render audio content to an arbitrary number of loudspeakers with an arbitrary configuration, as well as providing a binaural experience over headphones. Extensive support for meta-data in the bit stream and the user interface provides for a rich, interactive control of the presentation of the audio program.

**Call for Evidence issued for High Dynamic Range and Wide Color Gamut**

MPEG has issued a Call for Evidence (CfE) of new tools that may improve the performance of the current state-of-the-art video coding standard, ISO/IEC 23008-2 HEVC, to efficiently code High Dynamic Range (HDR) and Wide Color Gamut (WCG) video.  The results of the CfE will be analyzed to determine if MPEG should launch a new standardization effort to extend the current capabilities of HEVC. Responses to the CfE are due in May. Additional information, including how to respond to the CfE, will soon be available at: <http://mpeg.chiariglione.org/meetings/111>.

**International Standard for Dynamic Range Control arrives**

The International Standard for Dynamic Range Control (DRC) for audio was finalized and will be published as MPEG-D Part 4 (ISO/IEC 23003-4). It defines a unified, flexible, and codec-agnostic format to support comprehensive dynamic range and loudness control. A wide range of content delivery use cases such as streaming and broadcast are addressed. The standard enables adapting the audio as appropriate for the particular content, the listening device, environment, and user preferences. The integrated loudness control can be used, for instance, to provide a consistent loudness level across various content, which might be mandated in certain environments. MPEG-D Part 4 is directly supported by various MPEG audio codecs including MPEG-H 3D Audio. In addition, the standard is also supported with any audio stream that can be stored in files based on the ISO Base Media File Format (ISO/IEC 14496-12).

**HEVC improvements for Screen Content Coding and 3D Video**

At this meeting, MPEG began the approval process for an important new enhancement of the High Efficiency Video Coding (HEVC) standard – the Screen Content Coding (SCC) extensions. Screen content is video containing a significant proportion of rendered (moving or static) graphics, text, or animation rather than, or in addition to, camera-captured video scenes; the draft new SCC extensions of HEVC are capable of greatly improving the compression of screen content. Example applications include wireless displays, remote computer desktop access, and real-time screen sharing for videoconferencing. The technical development of the SCC extensions has been performed by the joint MPEG-VCEG video coding team JCT-VC. The draft specification for the SCC extensions was issued for a PDAM ballot at the 111th MPEG meeting, and its development is expected to be completed in February 2016.

Moreover, at the 111th MPEG meeting, the standardization of the 3D-HEVC extensions was completed. 3D-HEVC improves the compression of 3D video with multiple views and depth maps by coupling together the encoding of the video views and the depth maps. The depth maps for 3D video enable enhanced capabilities such as the synthesis of additional viewpoint perspectives that are not directly represented in the compressed video data. The technical development of 3D-HEVC extensions has been performed bythe jointMPEG-VCEG 3D video team JCT-3V, culminating in the final draft amendment (FDAM) for 3D-HEVC produced at the 111th MPEG meeting.

MPEG also has a longstanding commitment to facilitate implementation, encourage adoption, and promote multi-vendor interoperability of its standards by providing reference software and conformance testing suites. At the 111th MPEG meeting, major milestones for reference software for video coding standards were reached as follows:

* Format range extensions of HEVC (at the Draft Amendment or DAM ballot stage)
* Multiview extensions of HEVC (at DAM ballot)
* Multi-resolution frame-compatible video with depth maps for AVC (also at DAM ballot),
* Scalability extensions of HEVC (Proposed DAM or PDAM ballot), and the 3D-HEVC extensions (also at PDAM ballot).

Major milestones for video conformance test sets included:

* 3D-AVC extensions (Final DAM or FDAM completion)
* Multi-view and 3D video extensions of HEVC (at DAM ballot)
* Multi-resolution frame-compatible video with depth maps for AVC (DAM ballot),
* Improved version 1 and format range extensions profiles of HEVC (PDAM ballot),
* Scalable extensions of HEVC (PDAM ballot).

**New Part 22 of MPEG-21 provides application-agnostic user descriptions**

Understanding that the use of multimedia has become more pervasive in our daily lives and that multimedia services are becoming increasingly customized to specific user needs, MPEG has issued the Committee Draft for a new standard to specify generic user descriptions which may be used across multiple services or applications for a form of "standardized cookies", a technology widely used by Internet browsers. ISO/IEC 21000-22 provides four description technologies that can be used to help describe the user and the context in which that user is operating a particular service. Such a description can then be used to facilitate the recommendations of other services that are relevant to the user and his/her context. The four descriptions specified in ISO/IEC 21000-22 include: the user description (UD), the description of the context (CD), the description of a service (SD) to offer recommendations to the user, and the description of the recommendation (RD).

**Development of standard for Publish/Subscribe Application Format underway at MPEG 111**

At its 111th meeting, MPEG has also started working on an application format that enables communication between user posting or searching for multimedia information to an intermediate service. The new format defined by ISO/IEC 23000-16 Publish/Subscribe Application Format (PSAF) enables *Publishers* who create and store Resource Information (RI) to send Publications Information (PI). *Subscribers* can then send Subscriptions Information (SI) to *Match Service Providers* (MSP) who perform matches of Subscriptions with Publications and send Notification Information (NI) to users listed in PIs and SIs when a Match has been found. MPEG technologies used in PSAF, such as User Description and Contract Expression Language allow automatic management of business relationships between Publisher and MSP, and Subscriber and MSP.

**Digging Deeper – How to Contact MPEG, Tutorials, and other MPEG facts**

Communicating the large and sometimes complex array of technology that the MPEG Committee has developed is not a simple task. Experts, past and present, have contributed a series of tutorials and vision documents that explain each of these standards individually, and can be found on the MPEG homepage at <http://mpeg.chiariglione.org>. Examples of tutorials that can be found on the MPEG homepage include: High Efficiency Video Coding, Advanced Audio Coding, Universal Speech and Audio Coding, and DASH to name a few. This repository of resources continues to grow after each MPEG meeting. You can start your MPEG adventure at <http://mpeg.chiariglione.org/>

**Further Information**

Future MPEG meetings are planned as follows:

No. 112, Warsaw, PL, 22 – 26 June 2015

No. 113, Lucca, IT, 19 – 23 October 2015

No. 114, San Diego, CA, USA, 22 – 26 February 2016

No. 115, Geneva, CH, 30 – 03 May – June 2016

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The MPEG homepage also has links to other MPEG pages that are maintained by the MPEG subgroups. It also contains links to public documents that are freely available for download by those who are not MPEG members. Journalists that wish to receive MPEG Press Releases by email should contact Dr. Arianne T. Hinds at [a.hinds@cablelabs.com](mailto:a.hinds@cablelabs.com)