CHANGE REQUEST

DASH-IF IOP	CR 0024	rev 0	Current version: 4.2

Status:		Draft		Internal Review	X	Community Review		Editor's Proposal		Agreed

Title:	Addition of MPEG-D USAC (Unified Speech and Audio Coding) to DASH-IF IOP
Source:	Fraunhofer IIS
Supporting Companies:	Fraunhofer IIS, Dolby, castLabs, Bitmovin, Sony, Panasonic, Philips, ETRI
Category:	**A** ***Date:*** 2018-05-14

Use one of the following categories:
A *(addition of feature)*
B *(editorial modification)*
C *(correction)*

Reason for change:	MPEG-D Unified Speech and Audio Coding (USAC), as defined in ISO/IEC 23003-3, has been designed to provide consistently high audio quality with a variety of content that comprises a mixture of audio and speech signals. The main advantage for DASH is the adaptive switching capability from 12 kbps stereo up to transparency.
Summary of change:	Addition for signaling of audio encoded with MPEG-D USAC.
Consequences if not approved:	Not applicable.

Sections affected:	Acronyms, Abbreviations and Definitions; References; 1, 9.2.6 (new), 9.4.7 (new)
Other comments:	

Disclaimer:	This document is not yet final. It is provided for public review until the deadline mentioned below. If you have comments on the document, please submit comments by one of the following means: - at the github repository https://github.com/Dash-IndustryForum/IOP/issues (public at https://gitreports.com/issue/haudiobe/DASH-IF-IOP) - dashif+iop@groupspaces.com with a subject tag [USAC], or Please add a detailed description of the problem and the comment. Based on the received comments a final document will be published latest by the expected publication date below, integrated in a new version of DASH-IF IOP if the following additional criteria are fulfilled: - All comments from community review are addressed - The relevant aspects for the Conformance Software are provided - Verified IOP test vectors are provided
Commenting Deadline:	June 30th, 2018
Expected Publication:	August 31st, 2018

This document proposes the extension of the current DASH-IF Interoperability document by adding the support for MPEG-D Unified Speech and Audio Coding (USAC). For this purpose, this document will reference the xHE-AAC media profile as defined by the Common Media Application Format (CMAF) specification. The sections below highlight the envisioned changes to be integrated into the latest version of the IOP document (v4.01).

===== 1. CHANGE =====

Acronyms, Abbreviations and Definitions

Add the following terms to the list of abbreviations:

USAC Unified Speech and Audio Coding

xHE-AAC Extended High Efficiency AAC: a specific USAC profile

===== 2. CHANGE =====

References

Add the following entries to the list of normative references:

[84] ISO/IEC 23000-19:201x - Information technology -- Coding of audio-visual objects -- Part 19: Common media application format (CMAF) for segmented media, Amendment 2: xHE-AAC and other media profiles

===== 3. CHANGE =====

1. Introduction

Update Table 2 as indicated below:

Table 1 DASH-IF Interoperability Point Extensions

Extension	Identifier	Version	Section
DASH-IF HEVC HDR PQ10	`http://dashif.org/guidelines/dash-if-uhd#hdr-pq10`	4.0	**Error! Reference source not found.**
DASH-IF multichannel audio extension with USAC	**`Error! Reference source not found.`**	4.1	9.4.7.3

===== 4. CHANGE =====

Add this section after section 9.2.5.

9.2.6. MPEG-D Unified Speech and Audio Coding

9.2.6.1. Overview

MPEG-D Unified Speech and Audio Coding (USAC) has been designed to provide consistently high audio quality with a variety of content that comprises a mixture of audio and speech signals. Using such a codec in a DASH streaming environment enables adaptive switching capability from 12 kbps stereo up to transparency.

The Common Media Application Format (CMAF) [84] defines a media profile for MPEG-D USAC that is suitable for streaming applications and can be, therefore, referenced here.

9.2.6.2. DASH-specific issues

In the context of DASH-IF IOPs, the following applies to the xHE-AAC profile:

- Content representations encoded with MPEG-D USAC shall comply with the Extended High Efficiency AAC (xHE-AAC) CMAF media profile 'cxha', as defined in [84], providing support up to 5.1 multichannel coding.
- All representations of an adaptation set shall conform to the CMAF switching set constraints.
- The codec signaling is according to RFC6381 **Error! Reference source not found.** and documented in Table 27.
- The profiles mime sub- parameter of the @mimetype attribute [shall/should] include 'cxha'
- If the ChannelConfiguration [param] is present in the [movie header], then the t identical channel configuration shall be signaled by means of the **`AudioChannelConfiguration`** element in the MPD, according to the values specified in Table K.2 [84].
- The CMAF xHE-AAC media profile [84] requires each CMAF Fragment to start with an SAP of type 1.

Table 27 Codecs parameters according to RFC 6381 Error! Reference source not found. **and ISO BMFF encapsulation for MPEG-D USAC**

Codec	Codec Parameter	ISO BMFF Encapsulation	SAP type
MPEG-D USAC	`mp4a.40.42`	ISO/IEC 23000-19 [84]	1

Add this section after section 9.4.6.

===== 5. CHANGE =====

9.4.7. MPEG-D USAC Interoperability Points

9.4.7.1 Introduction

Conformance to DASH-IF audio extension with USAC according to ISO/IEC 23000-19:201x [84] may be signaled by an @profile attribute with the value "http://dashif.org/guidelines/dashif# cxha'".

9.4.7.2. Supporters

Fraunhofer IIS, Dolby, castLabs, Bitmovin, Sony,

9.4.7.3. Definition

Content may be authored claiming conformance to DASH-IF audio extension with USAC

- if the content is multichannel audio content as defined in section 9.4.1, and
- if the content conforms to what has been defined in section 9.2.6.2
- if a client can properly play the content by supporting at least the following features
    - all multichannel audio client features as defined in section 9.4.1
    - DASH-specific features defined in section 9.2.6.2