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S T A N D A R D S

Digital Video Subcommittee

AMERICAN NATIONAL STANDARD

ANSI/SCTE 243-4 2018

**Next Generation Audio Carriage for Cable Systems:
Part 4 – DTS-UHD Audio Carriage Constraints**

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Table of Contents

Title	Page Number
NOTICE	2
1 Introduction	4
1.1 Scope	4
2 Normative References	4
2.1 SCTE References	4
2.2 Standards from Other Organizations	4
3 Informative References	4
3.1 SCTE References	5
3.2 Standards from Other Organizations	5
4 Compliance Notation	5
5 Abbreviations and Definitions	5
5.1 Abbreviations	5
5.2 Definitions	5
6 DTS-UHD Compressed MPEG-2 Audio Transport	6
6.1 Overview	6
6.2 MPEG-2 Systems Signaling	6
6.2.1 Buffering Model	6
6.2.2 DTS-UHD Audio Descriptor	6
6.2.3 Semantics for Parameters	7
6.2.4 LongDescriptor Parameters	9
6.3 Audio Preselection Descriptor	12
6.3.1 Descriptor Usage	12
6.3.2 Parameters derived from the BroadcastChunk	12
6.4 DTS-UHD PES Packet Encapsulation	13
6.4.1 Stream Type	13
6.4.2 Stream ID	13
6.4.3 Audio Access Unit Alignment in PES packets	13
6.4.4 Random Access Points	14
6.4.5 Multiple Stream Requirements	14
7 DTS-UHD in ISO Media Files for delivery using MPEG DASH	14
7.1 Introduction	14
7.2 DASH Media Presentation Description (MPD) parameters for DTS-UHD	14
7.3 Design Rules for DTS-UHD Tracks	16
7.3.1 Overview	16
7.3.2 Track Header Box	16
7.3.3 Sync Sample Box	17
7.3.4 Handler Reference Box	17
7.3.5 Sound Media Header Box	17
7.3.6 Sample Description Box	17
7.3.7 AudioSampleEntry Box for DTS-UHD Formats	17
7.3.8 DTSUHDSampleEntry	17
7.3.9 DTSUHDSpecificBox	18
7.3.10 Additional Semantics for DTSUHDSpecificBox	19
7.4 Storage of DTS-UHD elementary streams	19
7.4.1 Overview	19
7.4.2 Random Access Points	19
7.4.3 Restrictions on DTS-UHD Formats	20

1 Introduction

1.1 Scope

This document is part four of a multi-part standard that specifies carriage constraints of Next Generation Audio (NGA) codecs in MPEG-2 Transport Stream and in MPEG ISO-BMFF media segments. In conjunction with ANSI/SCTE 243-1 [1], this document defines the carriage of DTS-UHD audio in MPEG-2 Transport Stream and MPEG DASH using ISO BMFF media segments.

2 Normative References

The following documents contain provisions, which, through reference in this text, constitute provisions of this document. At the time of Subcommittee approval, the editions indicated were valid. All documents are subject to revision; and while parties to any agreement based on this document are encouraged to investigate the possibility of applying the most recent editions of the documents listed below, they are reminded that newer editions of those documents might not be compatible with the referenced version.

2.1 SCTE References

- [1] ANSI/SCTE 243-1 2017, Next Generation Audio Carriage Constraints for Cable Systems: Part 1 – Common Transport Signaling
- [2] ANSI/SCTE 242-1 2017, Next Generation Audio Coding Constraints for Cable Systems: Part 1 – Introduction and Common Constraints
- [3] SCTE 242-4 2018, Next Generation Audio Coding Constraints for Cable Systems: Part 4 – DTS-UHD Audio Coding Constraints

2.2 Standards from Other Organizations

- [4] ISO/IEC 13818-1:2015, Information Technology – Generic coding of moving pictures and associated audio information: Systems
- [5] ATSC Standard A/342-1:2017, A/342 Part 1, Audio Common Elements
- [6] ISO/IEC 14496-12:2015, Information technology - Coding of audio-visual objects - Part 12: ISO Base Media File Format
- [7] ETSI TS 103 491 V1.1.1 (2017-04), DTS-UHD Audio Format; Delivery of Channels, Objects and Ambisonic Sound Fields
- [8] ETSI TS 103 584 V1.1.1 (2018-01), DTS-UHD Point Source Renderer
- [9] DVB BlueBook A038 (2017-12), Digital Video Broadcasting (DVB); Specification for Service Information (SI) in DVB systems (Final draft of ETSI EN 300 468 v 1.16.1)
- [10] IETF RFC 6381 The 'Codecs' and 'Profiles' Parameters for "Bucket" Media Types
- [11] DASH IF: "Guidelines for Implementation: DASH-IF Interoperability Points for ATSC 3.0, Version 1.0," January 31, 2016. <http://dashif.org/wp-content/uploads/2017/02/DASH-IF-IOP-for-ATSC3-0-v1.0.pdf>

3 Informative References

The following documents might provide valuable information to the reader but are not required when complying with this document.

3.1 SCTE References

- [12] ANSI/SCTE 54:2015, Digital Video Service Multiplex and Transport Subsystem Standard for Cable Television.

3.2 Standards from Other Organizations

- [13] IETF RFC4151 The ‘tag’ URI Scheme

4 Compliance Notation

shall	This word or the adjective “ required ” means that the item is an absolute requirement of this document.
shall not	This phrase means that the item is an absolute prohibition of this document.
forbidden	This word means the value specified shall never be used.
should	This word or the adjective “ recommended ” means that there may exist valid reasons in particular circumstances to ignore this item, but the full implications should be understood and the case carefully weighted before choosing a different course.
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5 Abbreviations and Definitions

5.1 Abbreviations

SCTE	Society of Cable Telecommunications Engineers
LFE	Low Frequency Effects

5.2 Definitions

This specification uses the definitions defined in ANSI/SCTE 242-1[2] and, by incorporation, ATSC A/342-1[5]. The following terms have definitions specific to DTS-UHD and shall apply to all clauses in this document.

Audio Frame – unit of coded audio that, when decoded, will generate defined number of uncompressed Linear PCM audio samples for each wave form

Audio Stream – sequence of synchronized Audio Frames.

BroadcastChunk - block of data within an audio stream containing data that maps audio components to preselections as defined in SCTE 242-4[3]

Frame Duration –time represented by one decoded Audio Frame

non-sync frame – Audio Frame that may require prior frames for correct decode (refer to SCITE 242-4 [3])

Object – Audio Element as defined in ATSC A/342-1[2] and referenced in ANSI/SCITE 242-1[1]

Object Group - selected collection of audio objects to be played together

Presentation - selected collection of Channels, or Objects and Object Groups used together to generate the rendered output

sync frame – Audio Frame that is independently decodable (refer to SCITE 242-4 [3]).

6 DTS-UHD Compressed MPEG-2 Audio Transport

6.1 Overview

The following sections specify the signaling of DTS-UHD audio component in MPEG programs.

6.2 MPEG-2 Systems Signaling

6.2.1 Buffering Model

It is recommended that the main audio buffer size (BS_n , as defined in ISO/IEC 13818-1 [4] clause 2.4.2) has a fixed value of 66,434 bytes.

6.2.2 DTS-UHD Audio Descriptor

The DTS-UHD Audio Descriptor shall be included in the program map section following the relevant ES_info_length field for any DTS-UHD audio stream component coded in accordance with TS 103 491 [7] that is included in the MPEG program.

The syntax for the DTS-UHD Audio Descriptor shall be as defined in Table 1 below. All values presented in the DTS-UHD descriptor are interpreted as unsigned integer values, most significant bit first.

Table 1: DTS-UHD descriptor

Syntax	size (bits)	mnemonic	Reference
dts-uhd_descriptor {	8	bslbf	
descriptor_tag	8	uimsbf	
descriptor_length	8	uimsbf	
if (descriptor_tag = 0x7F)	8	uimsbf	6.2.3.1
descriptor_tag_extension (8)			
DecoderProfileCode	6	uimsbf	6.2.3.2
FrameDurationCode	2	bslbf	6.2.3.3
MaxPayloadCode	3	bslbf	6.2.3.4
ExtendedDescriptor	1	bslbf	
LongDescriptor	1	bslbf	6.2.3.6
StreamIndex	3	bslbf	6.2.3.7
if (LongDescriptor) {			