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Edition 1.0 2016-12

INTERNATIONAL STANDARD

NORME INTERNATIONALE

Consumer terminal function for access to IPTV and open internet multimedia services –
Part 2-1: Media formats

Fonction des terminaux grand public pour l'accès aux services IPTV et multimédias de l'internet ouvert –
Partie 2-1: Formats des médias

IEC 62766-2-1:2016-12(en-fr)

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CONSUMER TERMINAL FUNCTION FOR ACCESS TO IPTV AND OPEN INTERNET MULTIMEDIA SERVICES –

Part 2-1: Media formats

FOREWORD

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International Standard IEC 62766-2-1 has been prepared by IEC technical committee 100: Audio, video and multimedia systems and equipment.

The text of this standard is based on the following documents:

CDV	Report on voting
100/2487/CDV	100/2657/RVC

Full information on the voting for the approval of this International Standard can be found in the report on voting indicated in the above table.

This document has been drafted in accordance with the ISO/IEC Directives, Part 2.

This International Standard is to be used in conjunction with IEC 62766-1.

A list of all parts in the IEC 62766 series, published under the general title *Consumer terminal function for access to IPTV and open internet multimedia services* can be found on the IEC website.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under "http://webstore.iec.ch" in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

INTRODUCTION

The IEC 62766 series is based on a series of specifications that was originally developed by the OPEN IPTV FORUM (OIPF). They specify the user-to-network interface (UNI) for consumer terminals to access IPTV and open internet multimedia services over managed or non-managed networks as defined by OIPF.

The set of media formats specified in this standard comprises:

- audio-video media formats (Clause 4), being combinations of the individual formats below.
- systems layer formats (Clause 5),
- video codecs and their usage (Clause 6),
- subtitle formats and their usage (Clause 7),
- teletext formats and their usage (Clause 8),
- audio codecs and their usage (Clause 9), and
- graphics and still image codecs and formats (Clause 10).

For each of these codecs and formats, it is specified how they apply to the overall system and to the various IPTV services (described in IEC 62766-1), including the implications for interoperability.

Figure 1 summarises the set of media formats specified by the present document in the form of a media formats stack. Media formats are specified at the content layer (audio, video, etc.) and for the systems layer. Transport protocols below the systems layer are specified in IEC 62766-4-1.

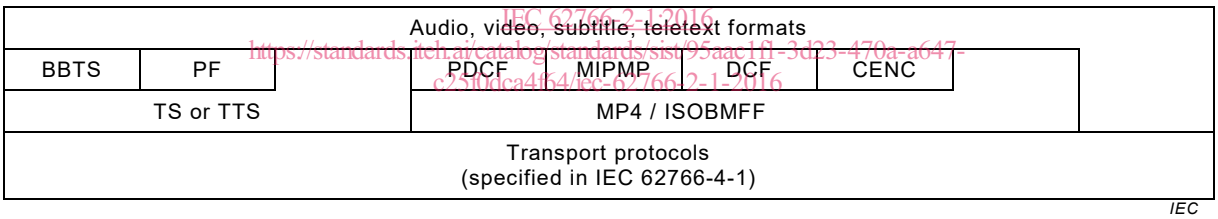

Figure 1 – Media formats stack

CONSUMER TERMINAL FUNCTION FOR ACCESS TO IPTV AND OPEN INTERNET MULTIMEDIA SERVICES –

Part 2-1: Media formats

1 Scope

This part of IEC 62766 specifies formats for the audio/video content provided by IPTV services using fixed line access networks or mobile access networks and voice and video telephony services. It does not apply to the broadcast channel input of hybrid devices except where explicitly specified.

This part of IEC 62766 defines formats for the delivery of 3D video. At the present time, delivery to fixed terminals is targeted. No special provision is made for mobile or portable devices.

This standard defines the media formats utilised on the UNI reference point UNIT-17 of the Open IPTV Forum functional architecture.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 62481-2:2013, *Digital living network alliance (DLNA) home networked device interoperability guidelines – Part 2: DLNA media formats*

IEC 62766-1[1], *Consumer terminal function for access to IPTV and open internet multimedia services – part 1: General*

IEC 62766-3:2016, *Consumer terminal function for access to IPTV and open internet multimedia services – part 3: Content metadata*

IEC 62766-4-1[2], *Consumer terminal function for access to IPTV and open internet multimedia services – part 4-1: Protocols*

IEC 62766-5-1[3], *Consumer terminal function for access to IPTV and open internet multimedia services – part 5-1: Declarative application environment*

IEC 62766-6[4], *Consumer terminal function for access to IPTV and open internet multimedia services – part 6: Procedural application environment*

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[1] Under preparation. Stage at the time of publication: IEC/CDV 62766-1:2015

[2] Under preparation. Stage at the time of publication: IEC/CDV 62766-4-1:2015

[3] Under preparation. Stage at the time of publication: IEC/CDV 62766-5-1:2015

[4] Under preparation. Stage at the time of publication: IEC/CDV 62766-6:2015

IEC 62766-7:—[5], *Consumer terminal function for access to IPTV and open internet multimedia services – part 7: Authentication, content protection and service protection*

ISO/IEC 11172-3, *Information technology – Coding of moving pictures and associated audio for digital storage media at up to about 1,5 Mbit/s – Part 3: Audio*
ISO/IEC 11172-3:1993/Cor 1:1996

ISO/IEC 13818-1:2015, *Information technology – Generic coding of moving pictures and associated audio information – Part 1: Systems*

ISO/IEC 13818-2:2013, *Information technology – Generic coding of moving pictures and associated audio information – Part 2: Video*

ISO/IEC 14496-2:2004, *Information technology – Coding of audio-visual objects – Part 2: Visual*

ISO/IEC 14496-3:2009, *Information technology – Coding of audio-visual objects – Part 3: Audio*

ISO/IEC 14496-10:2005, *Information technology – Coding of audio-visual objects – Part 10: Advanced video coding*

ISO/IEC 14496-12:2012, *Information technology – Coding of audio-visual objects – Part 12: ISO base media file format*

ISO/IEC 14496-14:2003, *Information technology – Coding of audio-visual objects – Part 14: MP4 file format*

ISO/IEC 14496-15:2014, *Information technology – Coding of audio-visual objects – Part 15: Carriage of network abstraction layer (NAL) unit structured video in ISO base media file format*

ISO/IEC 23001-7:2015, *Information technology – MPEG systems technologies – Part 7: Common encryption in ISO base media file format files*

ISO/IEC 23003-1:2007, *Information technology – MPEG audio technologies – Part 1: MPEG Surround*
ISO/IEC 23003-1:2007/Cor:2009

ITU-T Recommendation G.711, *Pulse code modulation (PCM) of voice frequencies*

ITU-T Recommendation G.719, *Low-complexity, full-band audio coding for high-quality, conversational applications*

ITU-T Recommendation G.722, *7 kHz Audio Coding within 64 Kbit/s*

ITU-T Recommendation G.729 (2012), *Coding of speech at 8 kbit/s using conjugate-structure algebraic-code-excited linear prediction (CS-ACELP)*

ITU-T Recommendation G.729.1, G.729 based Embedded Variable bit-rate coder: An 8-32 Kbit/s scalable wideband coder bitstream interoperable with G.729

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5 Under preparation. Stage at the time of publication: IEC/CDV 62766-7:2015

ITU-T Recommendation H.262, *Information technology – Generic coding of moving pictures and associated audio information: Video*

ITU-T Recommendation H.263 (2005), *Video coding for low bitrate communication*

ITU-T Recommendation H.264, *Advanced video coding for generic audiovisual services*

ETSI EN 300 468 V1.13.1 (2012-08), *Digital Video Broadcasting (DVB); Specification for Service Information (SI) in DVB systems*

ETSI EN 300 472 V1.3.1 (2003-05), *Digital Video Broadcasting (DVB); Specification for conveying ITU-R System B Teletext in DVB bitstreams*

ETSI EN 300 743 V1.4.1 (2011-10), *Digital Video Broadcasting (DVB); Subtitling systems*

ETSI TS 101 154 V1.11.1 (2012-11), *Digital Video Broadcasting (DVB); Specification for the use of Video and Audio Coding in Broadcasting applications based on the MPEG-2 Transport Stream*

ETSI TS 101 547 V1.1.1 (2012-01), *Digital Video Broadcasting (DVB); Frame Compatible Plano-stereoscopic 3DTV*

ETSI TS 102 034 V1.5.1 (2014-05), *Digital Video Broadcasting (DVB); Transport of MPEG-2 TS Based DVB Services over IP Networks*

ETSI TS 102 114 V1.4.1 (2012-09), *DTS Coherent Acoustics; Core and Extensions*

ETSI TS 102 366 V1.2.1 (2008-08), *Digital Audio Compression (AC-3, Enhanced AC-3) Standard*

ETSI TS 102 809 V1.2.1 (2013-07), *Digital Video Broadcasting (DVB); Signalling and carriage of interactive applications and services in hybrid broadcast / broadband environments*

ETSI TS 126 114 V10.0.0 (2011-04), *IMS Multimedia Telephony; media handling and interaction*

ETSI TS 181 005 V3.3.1 (2009-12), *TISPAN Service and Capability Requirements*

3GPP TS 26.171, *Speech codec speech processing functions; Adaptive Multi-Rate – Wideband (AMR-WB) speech codec; General description*

3GPP TS 26.190, *Speech codec speech processing functions; Adaptive Multi-Rate – Wideband (AMR-WB) speech codec; Transcoding functions*

3GPP TS 26.234 (2010-06), *Transparent end-to-end Packet-switched; Streaming Service (PSS); Protocols and codecs (Release 9)*

3GPP TS 26.245, *Transparent end-to-end Packet switched Streaming Service (PSS); Timed text format*

3GPP TS 26.290, *Audio codec processing functions; Extended Adaptive Multi-Rate – Wideband (AMR-WB+) codec; Transcoding functions*

3GPP TS 26.401, *General audio codec audio processing functions; Enhanced aacPlus general audio codec; General description*

Marlin Developer Community, *Marlin Broadband Transport Stream Specification, Version 1.0*, July 2008, available from http://www.marlin-community.com/develop/downloads

Marlin Developer Community, *Marlin Dynamic Media Zones, Version 1.1*, available from http://www.marlin-community.com/develop/downloads

Marlin Developer Community, "*Marlin – File Formats Specification*", Version 1.1, July 2008, and latest version of "*Marlin Errata: Marlin – File Formats Specification V1.1*", available from http://www.marlin-community.com/develop/downloads.

Marlin Developer Community, *OMArlin Specification*, Version 1.0.1, July 2008, available from http://www.marlin-community.com/develop/downloads

3GPP TS 26.071, *Mandatory speech CODEC speech processing functions; AMR speech Codec; General description*

Consumer Technology Association CTA-708-E (2013), *Digital Television (DTV) Closed Captioning*

CompuServe Incorporated, Columbus, Ohio, *Graphics Interchange Format version 89a*, © 1987, 1988, 1989, 1990

Eric Hamilton, C-Cube Microsystems, September 1, 1992, *JPEG File Interchange Format*, Version 1.02

3 Terms, definitions and abbreviated terms

For the purposes of this document, the terms, definitions and abbreviated terms given in IEC 62766-1 and the following apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at http://www.electropedia.org/
- ISO Online browsing platform: available at http://www.iso.org/obp

3.1 Terms and definitions

3.1.1
mobile audio/video service
IPTV service delivered using mobile access networks and protocols

3.2 Abbreviated terms

AAC	Advanced Audio Coding
AAC LC	AAC Low Complexity
ADPCM	Adaptive Differential Pulse-Code Modulation
AIT	Application Information Table
AMR	Adaptive Multi-Rate
AMR-WB	Adaptive Multi-Rate Wideband
ATSC	Advanced Television Systems Committee
CoD	Content on Demand
DCF	DRM Content Format
DRM	Digital Rights Management

DSM-CC	Digital Storage Media – Command and Control
DVB	Digital Video Broadcasting
EBU	European Broadcasting Union
EIT	Event Information Table
ETSI	European Telecommunications Standards Institute
Fps	Frames per second
GIF	Graphics Interchange Format
GOP	Group Of Pictures
HD	High Definition
HE-AAC	High Efficiency-AAC
JPEG	Joint Photographic Experts Group
MPEG	Moving Pictures Expert Group
MPS	MPEG Surround
OMA	Open Mobile Alliance
PAT	Program Association Table
PCM	Pulse-Code Modulation
PDCF	Pacjketised DRM Content Format
PID	Packed Identifier
PMT	Program MapTable
PNG	Portable Network Graphics
PS	Parametric Stereo
PSI	Programme Specific Information
SbS	Side by Side
SBR	Spectral Band Replication
SD	Standard Definition
SI	Service Information
S/PDIF	Sony/Philips Digital Interconnect Format
TaB	Top and Bottom
TTS	Timestamped Transport Stream
UDP	User Datagram Protocol
WAV	Waveform Audio File Format

4 Audio/video media formats

A set of audio/video media formats is defined, being combinations of audio, video and systems layer formats defined in the following subclauses.

The TS and TTS systems layer formats are specified in 5.2. The protection layers BBTS and PF are specified in IEC 62766-7.

MP4 systems layer format is specified in 5.3. The protection layers PDCF, MIPMP, CENC and DCF are specified in IEC 62766-7.

Video formats are defined in 6.2 and audio formats in 9.2.

IEC 62766-3 specifies how the media format of content is signalled in the metadata.

For audio/video content in 25-Hz video systems, the audio/video media format combinations are defined in Table 1.

Table 1 – Audio/video media formats for 25-Hz video systems

System format	Video format	Audio format	MIME type
TS	AVC_HD_25 AVC_SD_25 AVC_SP_25 AVC_3D_25	HEAAC HEAAC2 HEAAC_MPS MPEG1_L2 MPEG1_L2_MPS AC3 E-AC3 DTS	video/mpeg or video/mp2t
TTS	AVC_HD_25 AVC_SD_25 AVC_SP_25 AVC_3D_25	HEAAC HEAAC2 HEAAC_MPS MPEG1_L2 MPEG1_L2_MPS AC3 E-AC3 DTS	video/vnd.dlna.mpeg-tts
MP4	AVC_HD_25 AVC_SD_25 AVC_SP_25 AVC_3D_25	HEAAC HEAAC2 HEAAC_MPS MPEG1_L2 MPEG1_L2_MPS AC3 E-AC3 DTS	video/mp4
TS	MPEG2_SD_25 MPEG2_SP_25	MPEG1_L2 MPEG1_L2_MPS AC3 E-AC3	video/mpeg or video/mp2t
TTS	MPEG2_SD_25 MPEG2_SP_25	MPEG1_L2 MPEG1_L2_MPS AC3 E-AC3	video/vnd.dlna.mpeg-tts

For audio/video content in 30-Hz video systems the audio/video media format combinations are defined in Table 2.

Table 2 – Audio/video media formats for 30-Hz video systems

System Format	Video Format	Audio Format	MIME type
TS	AVC_HD_30 AVC_SD_30 AVC_SP_30 AVC_3D_30	HEAAC HEAAC2 HEAAC_MPS AC3 E-AC3 DTS	video/mpeg or video/mp2t
TTS	AVC_HD_30 AVC_SD_30 AVC_SP_30 AVC_3D_30	HEAAC HEAAC2 HEAAC_MPS AC3 E-AC3 DTS	video/vnd.dlna.mpeg-tts
MP4	AVC_HD_30 AVC_SD_30 AVC_SP_30 AVC_3D_30	HEAAC HEAAC2 HEAAC_MPS AC3 E-AC3 DTS	video/mp4

For protected audio/video content, the protected audio/video media format combinations are defined in Table 3.

Table 3 – Protected audio/video media formats

System format	Protection format	Video format	Audio format	MIME type
TS	BBTS PF	A combination of video format and audio format used for TS system, as defined by Table 1 and Table 2		video/mpeg or video/mp2t
TTS	BBTS PF	A combination of video format and audio format used for TTS system, as defined by Table 1 and Table 2)		video/vnd.dlna.mpeg-tts
MP4	PDCF MIPMP CENC	A combination of video format and audio format used for MP4 system, as defined by Table 1 and Table 2		video/mp4
	DCF	A combination of video format and audio format used for MP4 system, as defined by Table 1 and Table 2		application/vnd.oma.drm.dcf

The following audio media formats are defined that are independent of the video system, as shown in Table 4.