

INTERNATIONAL STANDARD

**Digital living network alliance (DLNA) home networked device interoperability
guidelines –
Part 2: DLNA media formats**

WITHDRAWN

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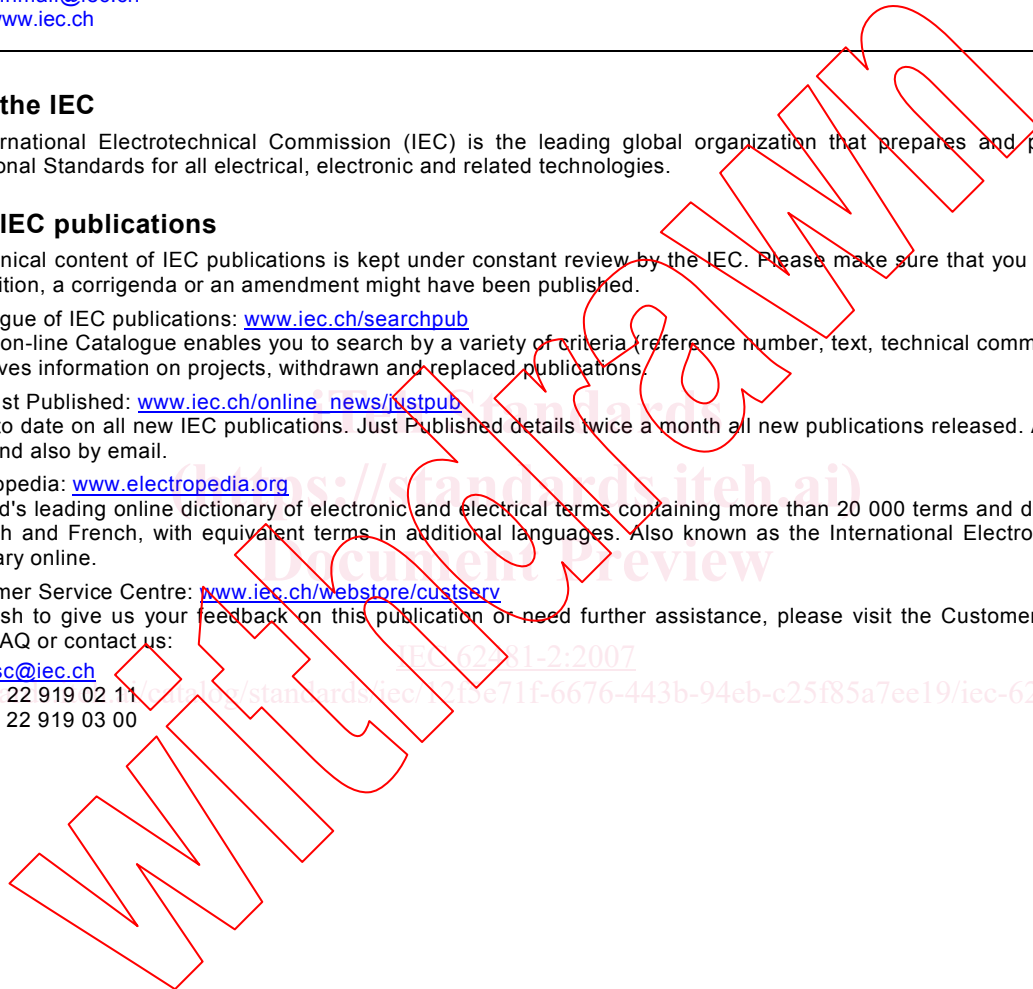
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INTERNATIONAL STANDARD

**Digital living network alliance (DLNA) home networked device interoperability
guidelines –
Part 2: DLNA media formats**

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

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CONTENTS

FOREWORD.....	5
1 Scope.....	7
2 Normative references	7
3 Terms, definitions and acronyms	9
3.1 Terms and definitions	9
3.2 Acronyms	17
4 Guideline terminology and conventions	19
4.1 Guideline compliance classifiers.....	19
4.2 Standard or specification usage classifiers.....	19
4.3 Guideline font usage conventions.....	20
4.4 Layout for guidelines	20
5 Compendium of media format profiles.....	22
5.1 General.....	22
5.2 Categorization labels.....	23
5.3 Audio class – AMR profiles.....	25
5.4 Audio class – ATRAC3plus profiles	25
6 Media format interoperability model.....	49
6.1 Media interoperability guidelines.....	49
6.2 Overall interoperability	49
6.3 Mandatory and optional profile guidelines.....	53
7 Image class media format profiles	56
7.1 JPEG profiling guidelines.....	56
7.2 PNG profiling guidelines.....	59
8 Audio class media format profiles	62
8.1 AC-3 profiling guidelines.....	62
8.2 AMR profiling guidelines.....	63
8.3 ATRAC3plus profiling guidelines	65
8.4 LPCM profiling guidelines.....	65
8.5 MP3 profiling guidelines	67
8.6 MPEG-4 profiling guidelines	69
8.7 WMA profiling guidelines	92
9 AV media class format profiles	94
9.1 General.....	94
9.2 MPEG-1 profiling guidelines	94
9.3 MPEG-2 profiling guidelines	96
9.4 MPEG-4 Part 2 profiling guidelines.....	129
9.5 MPEG-4 Part 10 (AVC) profiling guidelines.....	157
9.6 WMV9 profiling guidelines	210
10 Printing class media format profiles	216
10.1 General.....	216
10.2 Generic printing profiling guidelines, MF printing class – Profile parameter Sets – Profiles: All XHTML printing profiles	217
10.3 XHTML profiling guidelines.....	218
11 Media collection profile guidelines	220

11.1 DIDL-Lite playlist format	220
Annex A (informative) ASF recommended procedures	225
Annex B (normative) IFO file format field values within an IFO file	229
Bibliography.....	235
Figure 1 – Guideline layout and definitions	20
Figure 2 – Visual map of possible values for the attribute tables	22
Figure 3 – Profile summary table header.....	23
Table 1 – Categorization labels.....	23
Table 2 – JPEG profiles	24
Table 3 – Image class – PNG profiles	25
Table 4 – Audio class – AC-3 profiles	25
Table 5 – Audio class – AMR profiles.....	25
Table 6 – Audio class – ATRAC3plus profiles	25
Table 7 – Audio class – LPCM profiles.....	26
Table 8 – Audio class – MP3 profiles	26
Table 9 – Audio class – MPEG-4 profiles.....	26
Table 10 – Audio class – WMA profiles.....	28
Table 11 – AV class – MPEG-1 profiles.....	28
Table 12 – AV class – MPEG-2 profiles.....	29
Table 13 – AV class – MPEG-4 Part 2 profiles.....	33
Table 14 – AV class – MPEG-4 Part 10 (AVC) profiles.....	38
Table 15 – AV class – WMV9 profiles.....	48
Table 16 – Media collection profiles.....	49
Table 17 – Required media format profiles for the HND device category.....	56
Table 18 – MPEG-4 profile hierarchy	70
Table 19 – List of WMA profiles for the audio media class	92
Table 20 – MPEG-2 AV format resolutions.....	100
Table 21 – MPEG_TS_SD_NA, MPEG_TS_SD_NA_TDLNA_Part_2_Media_Formats_060621.doc	111
Table 22 – Video MPEG-2 AV encoding ParametersDLNA_Part_2_Media_Formats_060613.doc	114
Table 23 – MPEG_TS_SD_KO, MPEG_TS_SD_KO_T	116
Table 24 – MPEG_TS_HD_KO, MPEG_TS_HD_KO_T.....	117
Table 25 – MPEG-2 AV format resolutions	125
Table 26 – Summary of MPEG-4 Part 2 profiles for the AV media class	129
Table 27 – MPEGSP_L3 bit rates.....	132
Table 28 – MPEGSP_L3 resolutions	132
Table 29 – SP_L3_VGA resolutions	133
Table 30 – SP_L2 resolutions	134
Table 31 – SP_L0B video bit rate.....	135

Table 32 – ASP_L5 bit rates	136
Table 33 – ASP_L5 resolutions	136
Table 34 – ASP_L4_SO bit rates	139
Table 35 – ASP_L4_SO resolutions	139
Table 36 – H263_P0_L10 resolutions.....	141
Table 37 – H263_P3_L10 resolutions.....	142
Table 38 – CO resolutions	142
Table 39 – MPEG2_TS maximum system bit rate.....	151
Table 40 – MPEG2_TS, MPEG2_TS_T, and MPEG2_TS_ISO bit rates.....	152
Table 41 – Maximum system bit rate.....	156
Table 42 – Summary of MPEG-4 Part 10 (AVC) profiles for the AV media class.....	158
Table 43 – Pixel aspect ratio for AVC_TS_BL_CIF15_AAC_xxx and AVC_TS_MP_SD_xxx profiles	162
Table 44 – MPEG-4 Part 10 AV format frame rate.....	164
Table 45 – MPEG-4 Part 10 AV format resolutions.....	165
Table 46 – Frame rate and number of pictures in a GOP structure.....	170
Table 47 – MPEG-4 Part 10 AV format resolutions.....	171
Table 48 – MPEG-4 Part 10 AV format resolutions.....	173
Table 49 – MPEG-4 Part 10 AV format resolutions.....	177
Table 50 – MPEG-4 Part 10 AV format resolutions.....	181
Table 51 – MPEG-4 Part 10 AV format resolutions.....	183
Table 52 – MPEG-4 Part 10 AV format resolutions.....	185
Table 53 – MPEG-4 Part 10 AV format resolutions.....	187
Table 54 – MPEG-4 Part 10 AV format resolutions.....	187
Table 55 – MPEG-4 Part 10 AV format resolutions.....	190
Table 56 – MPEG-4 Part 10 AV format resolutions.....	193
Table 57 – MPEG-4 Part 10 AV format resolutions.....	195
Table 58 – MPEG-4 Part 10 AV format resolutions.....	196
Table 59 – MPEG-4 Part 10 AV format resolutions.....	197
Table 60 – MPEG-4 Part 10 AV format resolutions.....	199
Table 61 – MPEG-4 Part 10 AV format resolutions.....	200
Table 62 – MPEG-4 Part 10 AV format resolutions.....	204
Table 63 – MPEG-4 Part 10 AV format resolutions.....	204
Table 64 – List of WMV9 profiles for the AV media class	211
Table B.1 – Fields within an IFO file supplied by serving endpoint	229
Table B.2 – IFO file fields treatment by rendering endpoints	232

INTERNATIONAL ELECTROTECHNICAL COMMISSION

**DIGITAL LIVING NETWORK ALLIANCE (DLNA) HOME NETWORKED
DEVICE INTEROPERABILITY GUIDELINES –****Part 2: DLNA media formats**

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

CDV	Report on voting
100/1128/CDV	100/1214/RVC

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

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

A list of all parts of IEC 62481 series, published under the general title *Digital living network alliance (DLNA) home networked device interoperability guidelines*, can be found on the IEC website.

The committee has decided that the contents of this publication will remain unchanged until the maintenance result date indicated on the IEC web site under "<http://webstore.iec.ch>" in the data related to the specific publication. At this date, the publication will be

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

A bilingual version of this publication may be issued at a later date.

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DIGITAL LIVING NETWORK ALLIANCE (DLNA) HOME NETWORKED DEVICE INTEROPERABILITY GUIDELINES –

Part 2: DLNA media formats

1 Scope

This part of IEC 62481 specifies the DLNA media format profiles applicable to IEC 62481-1. Media format profiles are defined for each of the following media classes: audio, image, and AV. In addition, profile ID values that identify media collections and printer XHTML documents are also introduced.

It is envisioned that in the home network environment, devices will be capable of exchanging content items that originate from different sources. Content items will typically come encoded in different formats. The term "format" designates the compression and encoding tools utilized to generate the binary instance of a content item, which will be eventually exchanged over the home network using streaming or file transfer protocols. Examples of formats include MPEG-2, MPEG-4, WMV and others for video; or MP3, AAC, WMA and others for audio.

Formats alone, however, include as part of their specifications, multiple parameters, features and tools which can be used in a myriad of combinations to generate content binaries. In this standard, the notion of a format profile is introduced to identify a particular suitable combination of format parameters which define a way for representing content binaries. A format like MPEG-2, for example, can have multiple profiles depending on selections for the companion audio, the system-layer multiplexing specifications, allowed frame resolutions, allowed aspect ratios, allowed bit rates, etc.

This standard provides a quasi-exhaustive list of broadly-used format profiles for image, audio, and AV formats. For each particular format profile, this standard defines a profile ID text token to be used during the DLNA media discovery and media transfer operations. The profile ID is exposed in a server's content directory service (CDS) to signal to potential networked players or renderers the existence of a content item with particular coding and compression features defined precisely by the item's profile ID. This standard also describes the uses of format profiles which define media collections and printer XHTML documents.

The number of potential combinations for suitable profiles becomes large rather quickly, as evidenced by the long profile lists observed in the different sections of this standard. Consequently, this standard introduces the notion of mandatory profiles, supported by all devices, as a means to provide baseline content interoperability in the home. Servers have to be capable of exposing and transferring mandatory profiles while players and renderers have to be capable of decoding and rendering the mandatory profiles. Unfortunately, mandatory format profiles cannot be defined universally to suit all scenarios. For this reason, the definition of mandatory profiles is made taking into account the geographical region and the target device category.

2 Normative references

The following referenced documents are indispensable for the application 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 62481-1, *Digital living network alliance (DLNA) home networked device interoperability guidelines – Part 1: Architecture and protocols*

ISO/IEC 10918-1:1994, *Information technology – Digital compression and coding of continuous-tone still images: Requirements and guidelines*

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

ISO/IEC 11172-2:1993, *Information technology – Coding of moving pictures and associated audio for digital storage media at up to about 1,5 Mbit/s – Part 2: Video*

ISO/IEC 11172-3:1993, *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 13818-1:2000, *Information technology – Generic coding of moving pictures and associated audio information: Systems*

ISO/IEC 13818-2:2000, *Information technology – Generic coding of moving pictures and associated audio information: Video*

ISO/IEC 13818-3:1998, *Information technology – Generic coding of moving pictures and associated audio information – Part 3: Audio*

ISO/IEC 13818-11:2004, *Information technology – Generic coding of moving pictures and associated audio information – Part 11: IPMP on MPEG-2 systems*

ISO/IEC 14496-1:2001, *Information technology – Coding of audio-visual objects – Part 1: Systems*

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

Amendment 1 (2004)

Amendment 2 (2005)

Amendment 3 (2007)

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ISO/IEC 14496-3:2005, *Information technology – Coding of audio-visual objects – Part 3: Audio*

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

ISO/IEC 14496-12:2005, *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 14496-15:2004, *Information technology – Coding of audio-visual objects – Advanced Video Coding (AVC) file format*

ISO/IEC 15948:2004, *Information technology – Computer graphics and image processing – Portable Network Graphics (PNG): Functional specification*

ITU-R Recommendation BS.1196-11:2001, *Audio coding for digital terrestrial television broadcasting*

ITU-T Recommendation G.726:1990, *40, 32, 24,16 kbit/s Adaptive Differential Pulse Code Modulation (ADPCM)*

ITU-T Recommendation H.263:2005, *Video coding for low bit rate communication*

ITU-T Recommendation H.264:2005, *Advanced video coding for generic audiovisual services*

ETSI TSR 101 154 V1.4:2004, *Digital Video Broadcasting (DVB*) – Implementation Guidelines for the use of MPEG-2 Systems, Video and Audio Coding in Broadcasting Applications based on the MPEG-2 Transport Stream, European Telecommunications Standard Institute* http://webapp.etsi.org/action/PU/20050111/ts_101154v010601p.pdf

3 Terms, definitions and acronyms

For the purposes of this document, the following terms, definitions and acronyms are applicable.

3.1 Terms and definitions

3.1.1 download controller +DN+

one of the device capabilities defined by DLNA

3.1.2 printing controller +PR1+, +PR2+

one of the device capabilities defined by DLNA

3.1.3 push uploader +PU+

one of the device capabilities defined by DLNA

3.1.4 upload controller +UP+

one of the device capabilities defined by DLNA

3.1.5 3rd generation partnership project 3GPP1

file format designed by this organization and used to encapsulate data.

3.1.6 audio code 3 AC-3

audio format standard popularly known as Dolby Digital* for delivering up to 5.1 audio channels developed by Dolby Laboratories

3.1.7 adaptive multi-rate AMR

type of audio codec

3.1.8 extended adaptive multi-rate wideband AMR-WB+

type of audio codec

3.1.9

AMR-WBplus

Same as AMR-WB+

3.1.10

association of radio industries and businesses

ARIB

one of the standard bodies for digital television broadcasting

3.1.11

adaptive transform acoustic coding 3 plus

ATRAC3plus

audio codec developed by Sony Corporation

3.1.12

advanced television systems committee

ATSC

one of the standard bodies for digital television broadcasting

3.1.13

audio with video

AV

any media content that contains both moving pictures and sound

3.1.14

advanced video codec

AVC

H.264 video codec

3.1.15

bit-sliced arithmetic coding

BSAC

type of audio codec

3.1.16

content directory service 1.0

CDS

UPnP service that provides network-based discovery of content. The content directory service specification is a standard UPnP DCP.

3.1.17

content receiver

endpoint that consumes content received via a network transfer from another endpoint

3.1.18

content source

endpoint that places content onto the network for transfer to another endpoint

3.1.19

decoder friendly alignment position

position in the bitstream defined for decoder friendly alignment; it is always a valid transport alignment position

3.1.20

device capability

set of device functions (at least 1) aggregated to support a system usage; it cannot stand alone and must be deployed in conjunction with an implementation of a valid DLNA device class. Since a device capability does not stand alone, it is not required to have components in

all layers of the DLNA architecture; it may have a one to one correspondence to a device function. It is a certifiable entity only when it is implemented as an addition to at least one device class

3.1.21 device category

group of device classes with the same environmental characteristics and sharing common system usages that are enabling home networking use case scenarios

NOTE Examples used within this standard are home network device (HND), mobile handheld device (MHD), and home infrastructure device (HID). While device classes are grouped within a device category, a single physical device may support device classes that fall into multiple device categories.

3.1.22 device class

class defined by a set of device functions. It specifies the features supported on a device regardless of its physical attributes. Examples used within this standard are digital media server (DMS) and digital media player (DMP). A single device may support multiple device classes. A DLNA device must support at least one device class and may support one or more device capabilities. A device class is the certifiable entity in DLNA

3.1.23 digital living network alliance DLNA

organization that originally developed this standard

3.1.24 DLNA transport packet

term used to collectively refer to the three MPEG-2 transport stream packet formats defined by DLNA. These consist of a 188-byte ISO MPEG2 TS packet, a 192-byte packet consisting of a 188-byte ISO MPEG2 TS packet preceded by a 4-byte timestamp zero-value timestamp field, and a 192-byte packet consisting of a 188-byte ISO MPEG2 TS packet preceded by a 4-byte valid timestamp

3.1.25 digital media controller DMC

one of the device classes defined by DLNA

3.1.26 digital media player DMP

one of the device classes defined by DLNA

3.1.27 digital media printer DMPr

one of the device classes defined by DLNA

3.1.28 digital media renderer DMR

one of the device classes defined by DLNA

3.1.29 digital media server DMS

one of the device classes defined by DLNA

3.1.30

**digital video broadcast
DVB**

one of the standard bodies for digital television broadcasting

3.1.31

**digital versatile disc
DVD**

high-capacity multimedia data storage medium

3.1.32

elementary stream

general term for a coded video, coded audio, or other coded bitstream.

3.1.33

**exchangeable image file
EXIF**

standardized format for exchanging images

3.1.34

format

family of encoding algorithm that share similar features or characteristics, for example, the MPEG-4 family of AV encoding algorithms, the MPEG-2 family of encoding algorithms, or the WMV family of encoding algorithms.

3.1.35

format profile

particular instantiation of a media format; given one family of encoding algorithms, a particular combination of algorithms and encoding parameters results in content items encoded with very specific features. For example, given the MPEG-4 media format, a media format profile results from the selection of AVC encoding at main profile and Level 3, AAC audio, and the MP4 file format

3.1.36

**high-definition
HD**

picture quality at HDTV level

3.1.37

**high-definition television
HDTV**

television system which provides a higher quality display, with a vertical resolution display from 720p to 1080i and higher and an aspect ratio (the width to height ratio of the screen) of 16:9, for a viewing experience similar to watching a movie

3.1.38

**home network device
HND**

one of the device categories defined by DLNA

3.1.39

ID3, ID3v2

general tagging format for audio that makes it possible to store meta data about the audio inside the audio file itself. It is a tag mainly targeted at files encoded with MPEG-1/2 layer I, MPEG-1/2 layer II, MPEG-1/2 layer III, and MPEG-2.5, but may work with other types of encoded audio or as a stand-alone format for audio meta data