

DIN EN 62481-3



ICS 33.160.60; 35.110

**Digital living network alliance (DLNA) Interoperabilitäts-Richtlinien für
Geräte im Heimnetzwerk –
Teil 3: Verbindungsschutz (IEC 62481-3:2010);
Englische Fassung EN 62481-3:2011**

Digital living network alliance (DLNA) home networked device interoperability guidelines –
Part 3: Link protection (IEC 62481-3:2010);
English version EN 62481-3:2011

Instructions pour l'interopérabilité des appareils raccordés à un réseau domestique DLNA
(Digital living network alliance) –
Partie 3: Protection des liaisons (CEI 62481-3:2010);
Version anglaise EN 62481-3:2011

Gesamtumfang 73 Seiten

DKE Deutsche Kommission Elektrotechnik Elektronik Informationstechnik im DIN und VDE

Anwendungsbeginn

Anwendungsbeginn für die von CENELEC am 2010-12-01 angenommene Europäische Norm als DIN-Norm ist 2011-09-01.

Nationales Vorwort

Vorausgegangener Norm-Entwurf: E DIN EN 62481-3:2010-01.

Für diese Norm ist das nationale Arbeitsgremium K 742 „Audio-, Video- und Multimediasysteme, -geräte und -komponenten“ der DKE Deutsche Kommission Elektrotechnik Elektronik Informationstechnik im DIN und VDE (www.dke.de) zuständig.

Die enthaltene IEC-Publikation wurde vom TC 100 „Audio, video and multimedia systems and equipment“ erarbeitet.

Das IEC-Komitee hat entschieden, dass der Inhalt dieser Publikation bis zu dem Datum (stability date) unverändert bleiben soll, das auf der IEC-Website unter „<http://webstore.iec.ch>“ zu dieser Publikation angegeben ist. Zu diesem Zeitpunkt wird entsprechend der Entscheidung des Komitees die Publikation

- bestätigt,
- zurückgezogen,
- durch eine Folgeausgabe ersetzt oder
- geändert.

Da sich die Benutzer der vorliegenden Norm der englischen Sprache als Fachsprache bedienen, wird die englische Fassung der IEC 62481-3 veröffentlicht. Für die meisten der verwendeten Begriffe existieren keine gebräuchlichen deutschen Benennungen, da sich die deutschen Anwender in der Regel ebenfalls der englischen Benennungen bedienen. In Folge von Festlegungen zum DIN-Präsidialbeschluss 1/1978 werden in Abschnitt 3 (*Terms, definitions and acronyms*) der englischen Sprachfassung gelistete Begriffe ins Deutsche übersetzt (siehe informativer Anhang NA). Die deutschen Übersetzungen haben nur Empfehlungscharakter und können nur die ungefähre Begrifflichkeit in Deutsch wiedergeben. Unter Experten wird empfohlen, ausschließlich die englischen Fachbegriffe zu verwenden. Diese Norm steht nicht in unmittelbarem Zusammenhang mit Rechtsvorschriften und ist nicht als Sicherheitsnorm anzusehen.

Das Präsidium des DIN hat mit Präsidialbeschluss 1/2004 festgelegt, dass DIN-Normen, deren Inhalt sich auf internationale Arbeitsergebnisse der Informationsverarbeitung gründet, unter bestimmten Bedingungen allein in englischer Sprache veröffentlicht werden dürfen. Diese Bedingungen sind für die vorliegende Norm erfüllt.

Das englische Originalschriftstück IEC 62481-3:2010 enthält falsche Nummerierungen in den Überschriften einzelner Abschnitte, die **nicht** korrigiert wurden. Die korrekten Nummerierungen sind wie folgt:

7.5.2.2.5.2	korrekt: 7.5.2.2.5.1
7.3.2.6	korrekt: 7.6.3.2.6
9.6.1.4	korrekt: 9.6.1.3
9.6.1.5	korrekt: 9.6.1.4
9.6.1.6	korrekt: 9.6.1.5
9.6.1.7	korrekt: 9.6.1.6
9.6.1.7.1	korrekt: 9.6.1.6.1
9.6.1.7.2	korrekt: 9.6.1.6.2
9.6.1.8	korrekt: 9.6.1.7
9.6.1.8.1	korrekt: 9.6.1.7.1
9.6.1.8.2	korrekt: 9.6.1.7.2

Für den Fall einer undatierten Verweisung im normativen Text (Verweisung auf eine Norm ohne Angabe des Ausgabedatums und ohne Hinweis auf eine Abschnittsnummer, eine Tabelle, ein Bild usw.) bezieht sich die Verweisung auf die jeweils neueste gültige Ausgabe der in Bezug genommenen Norm.

Für den Fall einer datierten Verweisung im normativen Text bezieht sich die Verweisung immer auf die in Bezug genommene Ausgabe der Norm.

Der Zusammenhang der zitierten Normen mit den entsprechenden Deutschen Normen ergibt sich, soweit ein Zusammenhang besteht, grundsätzlich über die Nummer der entsprechenden IEC-Publikation. Beispiel: IEC 60068 ist als EN 60068 als Europäische Norm durch CENELEC übernommen und als DIN EN 60068 ins Deutsche Normenwerk aufgenommen.

Nationaler Anhang NA (informativ)

NA.1 Begriffe

Für das vorliegende Dokument gelten nachfolgend aufgelistete Übersetzungen zu den im Abschnitt 3 (*Terms, definitions and abbreviations*) der Englischen Sprachfassung dieser Norm aufgelisteten Begriffen.

Die deutschen Übersetzungen haben Empfehlungscharakter und können nur die ungefähre Begrifflichkeit in Deutsch wiedergeben. Unter Experten wird empfohlen, ausschließlich die englischen Fachbegriffe zu verwenden, um die Gefahr von Missverständnissen zu reduzieren.

NA1.1 Deutsche Übersetzungen

3.1.1^{N1)}

Authentifizierung und Schlüssel-Austausch

[en: authentication and key exchange]

KE

3.1.2

erweitertes System-Format

[en: advanced system format]

ASF

3.1.3

Ton mit Bild

[en: audio with video]

AV

3.1.4

AV-Transport

AVT

3.1.5

Klartext

[en: cleartext]

3.1.6

Klartext-Byte-Domäne

[en: Cleartext byte domain]

3.1.7

Kopfzeile zur Suchanforderung eines Klartext-Bytes

[en: cleartext byte seek request header]

^{N1)} Nationale Fußnote: Die Nummerierung der Begriffe aus IEC 62481-3:2010 wurde beibehalten.

3.1.8

Kopfzeile zur Suchantwort eines Klartext-Bytes

[en: cleartext byte seek response header]

3.1.9

Verbindungsmanager-Dienst

[en: connection manager service]

CMS

3.1.10

beisteuerende Quelle

[en: contributing source]

CSRC

3.1.11

dekoderfreundliche Ausrichtungsposition

[en: decoder friendly alignment position]

3.1.12

Netzwerk Allianz Digitales Leben

[en: digital living network alliance]

DLNA

3.1.13

DLNA-Verbindungsschutz

[en: DNLA link protection]

3.1.14

DNLA-QoS-Anwender-Priorität

[en: DNLA QoS user priority]

DNLAQOS_UP

3.1.15

Schutz von digitalen Übertragungsinhalten

[en: digital transmission content protocol]

DTCP

3.1.16

Schutz von digitalen Übertragungsinhalten in IP-Netzwerken

[en: digital transmission content protection over IP networks]

DTCP-IP

3.1.17

Bildergruppen

[en: group of pictures]

GOP

3.1.18

Hypertext-Übertragungsprotokoll

[en: hyper text transfer protocol]

HTTP

3.1.19

Element zu Verbindungsschutz-Anpassung

[en: link protection alignment element]

3.1.20

Verbindungsschutz

[en: link protection]

3.1.21

Verbindungsschutz-System

[en: link protection system]

3.1.22

Element zur Anpassung des Medienformats

[en: media format alignment element]

3.1.23

Mehrzweck-Erweiterung für Internet-Mail

[en: multipurpose internet mail extension]

MIME

3.1.24

Netzwerk-Byte-Domäne

[en: network byte domain]

3.1.25

Netzwerk-Konnektivität – Energieeinsparung

[en: network connectivity – energy saving]

NC-PS

3.1.26

geschütztes Inhaltspaket

[en: protected content package]

PCP

3.1.27

Programmstrom

[en: program stream]

PS

3.1.28

Echtzeit-Protokoll

[en: real time protocol]

RTP

3.1.29

Echtzeit-Datenstrom-Protokoll

[en: real time streaming protocol]

RTSP

3.1.30

Hin- und Rücklaufzeit

[en: round trip time]

RTT

3.1.31

Sitzungsbeschreibungs-Protokoll

[en: session description protocol]

SDP

3.1.32

einfaches Objektzugangs-Protokoll

[en: simple object access protocol]

SOAP

3.1.33

Zeitbereich

[en: time domain]

3.1.34

Transportstrom

[en: transport stream]

TS

3.1.35

einheitliches Verfügbarkeitsmodell für Client-Daten

[en: uniform client data availability model]

UCDAM

3.1.36

UPnP

3.1.37

einheitliche Ressourcenkennung

[en: uniform resource identifier]

URI

3.1.38

Bildobjekteinheit

[en: video object unit]

VOBU

3.1.39

leitungsgleichwertiger Datenschutz

[en: wired equivalency privacy]

WEP

3.1.40

Fenstermedien für Ton

[en: windows media audio]

WMA

3.1.41

Fenstermedien-DRM für Netzwerkgeräte

WMDRM-ND

3.1.42

Fenstermedien für Bild

[en: windows media video]

WMV

3.1.43

WiFi-geschützter Zugang

[en: WiFi protected access]

WPA

3.1.44

WiFi-geschützter Zugang Version 2

[en: WiFi protected access version 2]

WPA2

**Digital living network alliance (DLNA) home networked device
interoperability guidelines –
Part 3: Link protection
(IEC 62481-3:2010)**

Instructions pour l'interopérabilité des appareils
raccordés à un réseau domestique DLNA (Digital
living network alliance) –
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(CEI 62481-3:2010)

Digital living network alliance (DLNA)
Interoperabilitäts-Richtlinien für Geräte im
Heimnetzwerk –
Teil 3: Verbindungsschutz
(IEC 62481-3:2010)

This European Standard was approved by CENELEC on 2010-12-01. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CENELEC member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the Central Secretariat has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

CENELEC

European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

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Foreword

The text of document 100/1617/CDV, future edition 1 of IEC 62481-3, prepared by IEC TC 100, Audio, video and multimedia systems and equipment, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 62481-3 on 2010-12-01.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN and CENELEC shall not be held responsible for identifying any or all such patent rights.

The following dates were fixed:

- | | | |
|--|-------|------------|
| – latest date by which the EN has to be implemented
at national level by publication of an identical
national standard or by endorsement | (dop) | 2011-09-01 |
| – latest date by which the national standards conflicting
with the EN have to be withdrawn | (dow) | 2013-12-01 |

Annex ZA has been added by CENELEC.

Endorsement notice

The text of the International Standard IEC 62481-3:2010 was approved by CENELEC as a European Standard without any modification.

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

Part 3: Link protection

1 Scope

This part of IEC 62481 specifies the DLNA link protection guidelines, which are an extension of the DLNA guidelines. DLNA link protection is defined as the protection of a content stream between two devices on a DLNA network from illegitimate observation or interception using the protocols defined within this standard.

Content protection is an important mechanism for ensuring that commercial content is protected from piracy and illegitimate redistribution. Link protection is a technique that enables distribution of protected commercial content on a home network, thus resulting in greater consumer flexibility while still preserving the rights of copyright holders and content providers.

The guidelines in this standard reference existing technologies for link protection and provide mechanisms for interoperability between different implementations as well as integration with the DLNA architecture.

This standard is organized to align with the overall structure of IEC 62481-1 and IEC 62481-2.

2 Normative reference

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 62481-1:2007, *Digital living network alliance (DLNA) home networked device interoperability guidelines – Part 1: Architecture and protocols*

IEC 62481-2:2007, *Digital living network alliance (DLNA) home networked device interoperability guidelines – Part 2: DLNA media formats*

ISO/IEC 13818-1:2007, *Information technology – Generic coding of moving pictures and associated audio information: Systems*

ISO/IEC 13818-2:2007, *Information technology – Generic coding of moving pictures and associated audio information: Video*

ISO/IEC 14496-2:2004 *Information technology – Coding of audio-visual objects – Part 2: Visual Amendment 1 (2004), Error resilient simple scalable profile*

ISO/IEC 29341-3-10:2008, *Information technology – UPnP device architecture – Part 3-10: Audio video device control protocol – Audio video transport service*

ISO/IEC 29341-3-11:2008, *Information technology – UPnP device architecture – Part 3-11: Audio video device control protocol – Connection manager service*

ISO/IEC 29341-3-12:2008, *Information technology – UPnP device architecture – Part 3-12: Audio video device control protocol – Content directory service*

DTCP Volume 1 (informational version), *Digital transmission content protection specification* Volume 1, Revision 1.4: February 28, 2005

http://www.dtcp.com/data/info/20050228_dtcp_vol_1_1p4.pdf

DTCP Volume 1 Supplement E (informational version)

Mapping DTCP to IP, Revision 1.1: February 28, 2005

http://www.dtcp.com/data/info/20050228_dtcp_VISE_1p1.pdf

DTCP Audio Compliance Rules EXHIBIT B-2:

Compliance rules for licensed products that receive or transmit commercial audio works, June 2002

http://www.dtcp.com/data/Compliance_Rules_Audio_020610.pdf

IEEE 802.1Q, *IEEE standard for information technology – Telecommunications and information exchange between systems – IEEE standard for local and metropolitan area networks – Common specifications – Virtual Bridged Local Area Networks*

IEEE 802.11, *IEEE standard for information technology – Telecommunications and information exchange between systems – Local and metropolitan area networks-specific requirements – Part 11: Wireless LAN Medium, Access Control (MAC) and Physical Layer (PHY) specifications*

3 Terms, definitions and acronyms

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

3.1 Terms and definition

3.1.1

authentication and key exchange

AKE

step in a link protection system where the receiving device is authenticated and given the correct keys for the content

3.1.2

advanced system format

ASF

media format encapsulation for the transmission of content

3.1.3

audio with video

AV

any media content that contains both moving picture and sound

3.1.4

AV transport

AVT

UPnP service that provides network-based control for common transport operations such as play, stop, pause, next, previous, and seek, a standard UPnP DCP

3.1.5

cleartext

unencrypted content stream after decryption by the upstream content protection system and before encryption by the link protection system

3.1.6

cleartext byte domain

specification of a byte position in the cleartext content stream for a complete explanation of seek operations on link protected content, see Annex A

3.1.7

cleartext byte seek request header

used to signify any of those transport layer request headers; implies that the guideline applies to all uses of any of the request headers

3.1.8

cleartext byte seek response header

used to signify any of those transport layer response headers; implies that the guideline applies to all uses of any of the request headers

3.1.9

connection manager service

CMS

UPnP service that provides information about the supported transport protocols and media formats of a UPnP device, a standard UPnP DCP

3.1.10

contributing source

CSRC

source used for the RTP media transport

3.1.11

decoder friendly alignment position

position in the bitstream defined for decoder friendly alignment; always the start of a media format alignment element that can begin to process data without any other internal state information about the stream so that the decoder can begin processing at that point and create a valid output rendering

3.1.12

digital living network alliance

DLNA

organization that originally developed this standard

3.1.13

DLNA link protection

protection, using DLNA protocol elements as defined in these guidelines, of a content stream between two devices on a DLNA network from illegitimate observation or interception

3.1.14

DLNA QoS user priority

DLNAQOS_UP

DLNA-defined QoS label used to correlate an underlying IEEE 802.1Q user priority and WMM access category to a DLNA traffic type(s)

3.1.15

digital transmission content protection

DTCP

one of the link protection system

3.1.16

digital transmission content protection over IP networks

DTCP-IP

DTCP as applied IP based network

3.1.17

group of pictures

GOP

defined grouping of information in the MPEG 2 media format

3.1.18

hyper text transfer protocol

HTTP

protocol for transferring files across the Internet

NOTE Requires an HTTP client program on one end, and an HTTP server program on the other end.

3.1.19

link protection alignment element

unit of content carried within a link protected content stream starts with a packet header that is defined by the link protection system and contains bytes of the link protected stream

3.1.20

link protection

protection of a content stream between two devices on a DLNA network from illegitimate observation or interception

3.1.21

link protection system

specific collection of technologies with corresponding rules that enable secure content transfer between two endpoints

3.1.22

media format alignment element

unit of content carried within an unprotected content stream, starts at a decoder friendly alignment position for the given media format and contains an integral number of units of content as defined by the media format in use

3.1.23

multipurpose internet mail extension

MIME

standard system for identifying the type of data contained in a file

NOTE MIME is an Internet protocol that allows sending binary files across the Internet as attachments to e-mail messages. This includes graphics, photos, sound, video files, and formatted text documents.

3.1.24

network byte domain

specification of a byte position in the content stream as it is carried on the network transport

NOTE For content binaries that use a link protection system, this will include encryption and any necessary headers or padding required by the link protection system.

3.1.25

network connectivity – power saving

NC-PS

power saving modes of operations, as defined in IEC 62481-1

3.1.26

protected content packet

PCP

packet format for DTCP-IP link protected content, as defined in DTCP Volume 1 and DTCP Volume 1 Supplement E

3.1.27

program stream

PS

content binary stream usually in reference to an MPEG-2 AV stream format

3.1.28

real time protocol

RTP

media transport that provides end-to-end network transport functions for transmitting real-time data, such as AV

NOTE It provides services such as payload type identification, sequence numbering, time-stamping, and delivery monitoring.

3.1.29

real time streaming protocol

RTSP

protocol within the RTP protocol suite

3.1.30

round trip time

RTT

time between sending a network packet to a remote host and the time that the response is received

3.1.31

session description protocol

SDP

protocol within the RTP protocol suite

3.1.32

simple object access protocol

SOAP

XML based messaging protocol used to exchange service requests and responses over a network

3.1.33

time domain

specification of a position in the content stream in time units

3.1.34

transport stream

TS

content binary stream usually in reference to an MPEG-2 AV stream format

3.1.35

uniform client data availability model

UCDAM

model for representing which bytes of a content binary are available on a server for seek operations

NOTE See 7.5 of IEC 62481-1 for a full definition.

3.2.36

UPnP

architecture for pervasive peer-to-peer network connectivity of devices of all form factors

NOTE 1 See ISO/IEC 29341-1 for architecture description.

NOTE 2 It is designed to bring easy-to-use, flexible, standards-based connectivity to ad-hoc or unmanaged networks whether in the home, in a small business, public spaces, or attached to the Internet. It is a distributed, open networking architecture that leverages TCP/IP and Web technologies to enable seamless proximity networking in addition to control and data transfer among networked devices in the home, office, and public spaces.

3.1.37

uniform resource identifier

URI

W3C's codification of the name and address syntax of present and future objects on the Internet

NOTE In its most basic form, a URI consists of a scheme name (such as file, http, ftp, news, mailto, gopher) followed by a colon, followed by a path whose nature is determined by the scheme that precedes it. URI is the umbrella term for URNs, URLs, and all other uniform resource identifiers.

3.1.38

video object unit

VOBU

defined grouping of information in the MPEG 2 media format

3.1.39

wired equivalency privacy

WEP

wireless privacy standard used in conjunction with IEEE 802.11 networks

3.1.40

Windows media audio

WMA

audio compression binary format

3.1.41

Windows media DRM for network device

WMDRM-ND

one of the link protection system

3.1.42

Windows media video

WMV

AV compression binary format

3.1.43

WiFi protected access

WPA

system to secure a wireless IEEE 802.11 network

3.1.44

WiFi protected access version 2

WPA2

system to secure a wireless IEEE 802.11 network version 2

3.2 Abbreviation terms

BNF	Backus Naur Form
LWS	Linear WhiteSpace
MPEG-2	Moving Picture Experts Group phase 2
MIU	Media Interoperability Unit
MTU	Maximum Transmission Unit

UCDAM	Uniform Content Data Availability Model
UPnP	Universal Plug and Play
W3C	World Wide Web Consortium

4 DLNA home network architecture

Refer to IEC 62481-1, Clause 4 for detailed descriptions of the DLNA home networking architecture.

5 DLNA device model

Refer to IEC 62481-1, Clause 5 for detailed descriptions of the DLNA home networking architecture. This standard extends the existing DLNA devices and system usages to include link protected content used for the following:

- 2 box pull system usage;
- 2 box push system usage;
- 3 box system usage;

for the transfer and rendering of content items. These are the only system usages that are currently in scope for the use of DLNA link protection.

6 Guideline terminology and conventions

6.1 Guideline compliance classifiers

Reference [9]¹ provides a description of terminology conventions used in all IETF RFC documents. The terminology and conventions used by the DLNA home networked device interoperability guidelines are adapted from this reference. The details of each guideline will carry a compliance classifier from the following set.

[M]ust, Required, Shall: This is the minimum set of requirements that will ensure interoperability and/or robust operation between devices. All devices are expected to comply with these requirements when expressed in unconditional form. A conditional requirement expressed in the form, "If X, then Y shall be implemented", means that the requirement "Y" shall be met when the conditional aspect "X" applies to a given implementation.

[S]hould, Recommended: Recommended items are optional items that are strongly recommended for inclusion in products. The difference between "recommended" items and "optional" items, see below, is one of priority. When considering features for inclusion in a product, recommended items should be included first.

[O]ptional, May: Optional items are suggestions for features that will enhance the user experience or are offered as a less preferred choice relative to another recommended feature. If optional features are included, they shall comply with the requirement to ensure interoperability with other implementations.

6.2 Standard of specification usage classifiers

When specifying guideline details, it is often useful to reiterate or clarify certain aspects of a standard or specification that are often violated or misunderstood. Furthermore, there may be guideline requirements that intentionally contradict or restrict implementation of certain aspects of a standard or specification in order to ensure interoperability between DLNA devices. The following

¹ Figures in square brackets refer to the Bibliography.

classifiers are used in the DLNA home networked device interoperability guidelines to indicate the relationship of a specific guideline requirement to a source standard or specification:

[A]dding: A guideline requirement that adds to or supplements a standard or specification to enhance interoperability. A guideline requirement that does not reference a standard or specification also uses this classifier.

[C]larifying: A guideline requirement that addresses vague or ambiguous aspects of a standard or specification.

[F]ixing: A guideline requirement that intentionally supersedes and fixes aspects of a standard or specification that is incorrect and would otherwise provide a poor user experience or prevent device interoperability.

[L]imiting: A guideline requirement that narrows or specifies an exact behavior in areas where a standard or specification provides for greater degrees of latitude in implementation.

[R]epeating: A guideline requirement that repeats what is already in a standard or specification because of observed and repeated problems with implementations. Whenever a guideline requirement with this usage classifier seems to be in conflict with the actual standard, the standard prevails over the guideline requirement.

6.3 Guideline font usage conventions

The following font usage conventions are used within the DLNA home networked device interoperability guidelines to provide additional clarity.

- Hyperlinks to reference citations are indicated as [number]. For example [1], [20], ...
- HTTP headers and methods are always in bold font, such as CACHE-CONTROL.
- UPnP action names are indicated as: [Service acronym]:[action name], such as CDS: Browse.
- Special terms may be *italicized*. Sometimes a guideline requirement will define a term for use within that guideline and the term will be *italicized*.

6.4 Guideline syntax notation convention

The following are syntax (BNF) notation conventions used within the DLNA home networked device interoperability guidelines to provide readability.

- Linear whitespace (LWS) characters, such as carriage returns, spaces, tabs, or line feeds, are not implied anywhere in any of the syntax (BNF) definitions used within the interoperability guidelines.
- The use of LWS characters is restricted within the DLNA interoperability guideline unless explicitly specified in any of the syntax definitions with reference to UPnP HTTP communications.
- By default, text tokens and values have a case-sensitive treatment unless explicitly noted in the guidelines. This convention also applies to BNF definitions, XML tag names, XML tag values, capability IDs, and HTTP header values for HTTP headers used by the DLNA guidelines. One of the exceptions to this rule applies to the names of HTTP headers. HTTP header names have a case-insensitive treatment. For example TimeSeekRange.dlna.org is the same as timeseekrange.dlna.org. (See IEC 62481-1, 7.5.5.2.6). Other exceptions are described in each guideline which define BNF syntax.

6.5 Guideline normative and informative text conventions

All text that appears in the DLNA interoperability guidelines is to be considered normative unless explicitly stated otherwise, such as informative references and informative appendices. Normative text includes introductory text before guideline requirement tables, but testable requirements are only contained within guideline requirement table entries.

6.6 DLNA XML namespaces and schemas

The DLNA interoperability guidelines make numerous references to XML elements and attributes that are defined for DLNA device classes and device capabilities. However, these namespaces are intentionally not defined through a formal DLNA XML schema. This allows the DLNA interoperability guidelines to define new XML elements and attributes in the future, without having to define a new namespace or schema definition. DLNA devices classes and device capabilities are expected to exhibit tolerant behavior when encountering XML elements or attributes that are defined in the future, as required by existing IEC 62481-1, 7.3.24 and 7.4.1.3.1. Table 1 lists the namespace values that are used by DLNA guidelines and the context for their usage.

Table 1 – DLNA namespace values

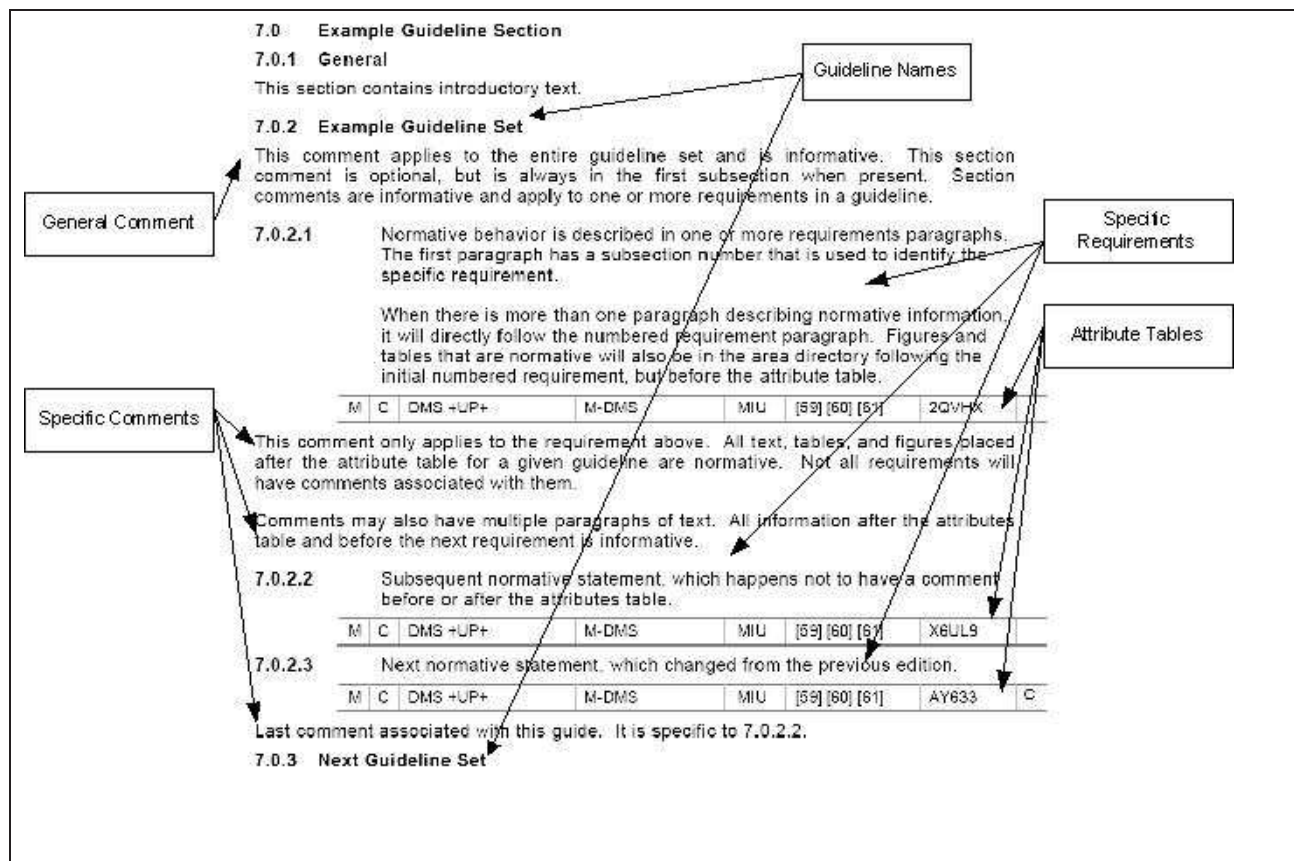
Namespace value	Usage context
urn:schemas-dlna-org:device-1-0	Used for XML elements and attributes defined by DLNA interoperability guidelines for use in UPnP device description files.
urn:schemas-dlna-org:metadata-1-0/	Used for XML elements and attributes defined by DLNA interoperability guidelines for use in DIDL-Lite documents and fragments.

7 Common link protection guidelines

7.1 General

This subclause contains the guidelines that are independent of the underlying link protection system. Subclauses 7.3 through 7.8 relate to the corresponding Subclauses 7.2 to 7.7 in IEC 62481-1. Subclause 7.9 contains information not related to that part and should be read first to provide context for 7.3 through 7.8.

These guidelines are in a clause/subclause format as shown in Figure 1.



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Figure 1 – Guideline layout and definitions

The following list describes the content of Figure 1.

- Name: A unique label for the guideline. The label is preceded with a sequentially increasing number to allow easy lookup.
- Requirements: The actual description of a guideline. A guideline is preceded with a sequentially increasing number in each volume to allow easy lookup.
- Attribute table: A summary of the essential attributes of a requirement. The table is a single row with the following definitions for the columns.
 - Compliance classifier: M/S/O (See 6.1 for the definition of guideline compliance classifiers).
 - The specification usage classifier: A/C/F/L/R: for the guideline. (See 6.2 for the definition of specification usage classifiers.)
 - HND device classes with device capabilities (see Table 2 and Table 3 of IEC 62481-1 for definitions). Device capabilities listed in the HND column of the attribute table. Device capabilities can also apply equally to the MHD device category but have been omitted from the MHD column in the attribute table to provide for better readability.
 - MHD device classes (see Table 4 of IEC 62481-1 for definitions).
 - HID device classes (see Table 5 of IEC 62481-1 for definitions).
 - Standards citation: Standards that are referenced by the guideline. Standards citations are by number and are referenced in Clause 2.
 - Guideline unique number: an alpha-numeric string that uniquely identifies a requirement.
 - Change indicator: documents the change in the requirement that occurred since the last edition of the guideline (see Table 2 for definitions).

- Guideline attribute columns that do not have a value have the designation "n/a" (not applicable). A visual map of possible values for the attribute tables is in Figure 2.
- d) Comment: Supplementary information about a guideline such as a justification for the guideline, the specific interoperability issue that is addressed, etc.
- Note that many guidelines do not explicitly list MIU since guidelines which apply to a device class also apply to the virtualized variants.

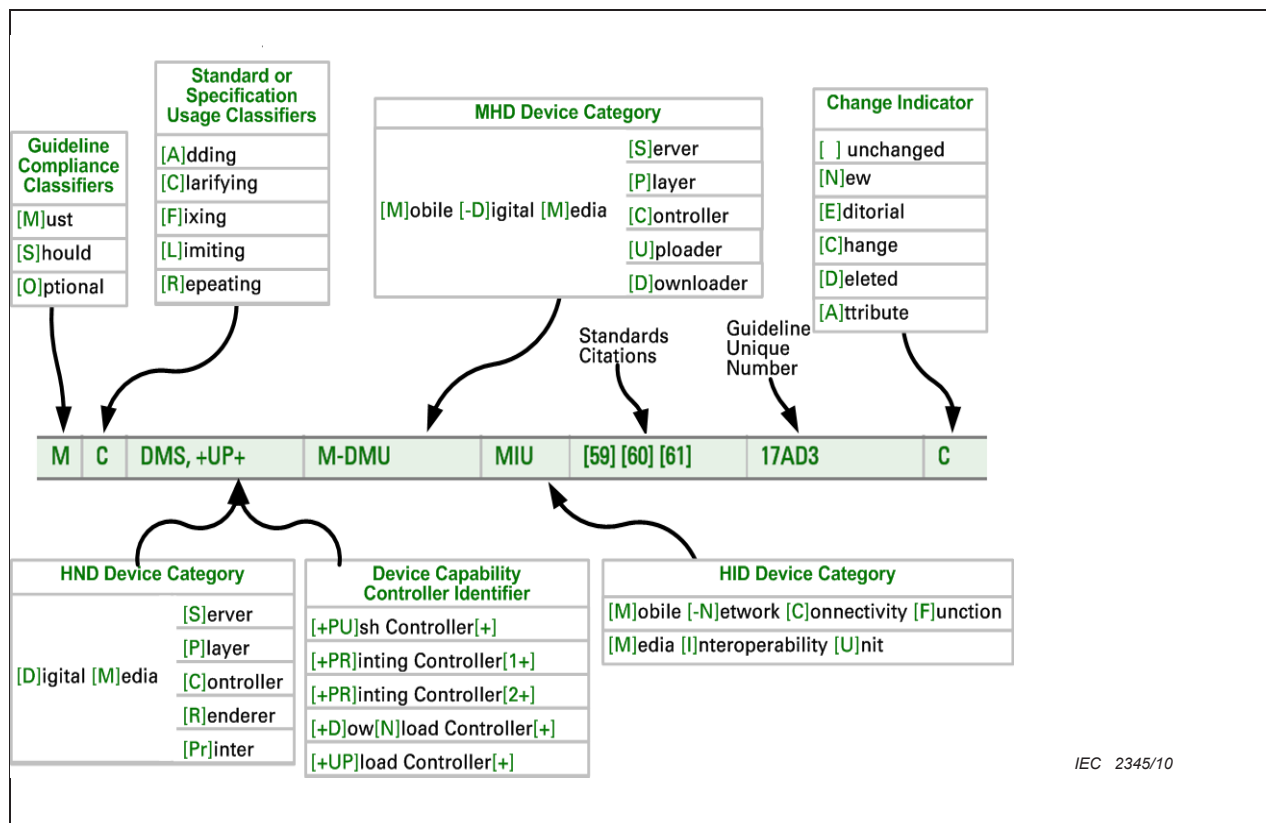


Figure 2 – Visual map of possible values for the attribute tables

Table 2 – Allowed values for change indicator field in attribute table

Value	Meaning
<blank>	No changes in the text or figures from the immediately-preceding version of this requirement.
A	Attribute table itself, excluding the change indicator, has changed. E.g. a new device class was added.
C	Changes made to the requirement modify the testing, intent, or other normative behavior relative to the immediately-preceding version of this requirement.
D	Requirement has been deleted. These requirements are moved to the deleted requirements document. Note that the change indicator for the requirement is marked deleted only the first time it appears in the deleted requirements' document; in subsequent versions of the deleted requirements' document the change indicator is reset to blank.
E	Changes made that do not modify testable requirements, intent, or other normative behavior.

7.2 Conditions for measuring time in message exchanges

These guidelines define in certain cases time constraints for the exchange of messages between two communicating endpoints. These time constraints have been defined as a means to provide some operational consistency between the two communicating endpoints. However, in best-effort networks, actual time measurements for exchanging messages show wide variations depending on perturbations derived from network conditions, traffic, available bandwidth, and others. For this reason, this subclause includes recommendations for conditions at the time of making these measurements, as follows.

- The two communicating endpoints should establish communications under Ideal network conditions.
- Time measurements at a given layer assume that the underlying layers preserve the communication channel. For example, time measurements at the HTTP layer cannot be valid if the underlying TCP/IP channel breaks during the measurements.
- Unless specified otherwise, time measurements assume that the communicating devices are both in active mode. This means that time measurements should not include transitions from sleep mode to active mode.

7.3 Networking and connectivity

7.3.1 General

The guidelines in this subclause provide requirements for general and device specific capabilities for networking that are independent of the link protection system used. For DTCP-IP specific requirements, see 8.2. For WMDRM-ND specific requirements, see 9.3.

The following additions shall be made to Table 8 of IEC 62481-1 to include the normative DLNA QoS levels for link protection messages.

Table 3 – Normative priorities for dlina traffic types for link protection

DLNAQOS_UP	DLNA traffic types	IEEE 802.1Q user priority	WMM access category	DSCP	Clause details
DLNAQOS_3 (Highest)	DLNA link protection key exchange	7	VO	0x38	.2.2 .3.2

7.3.2 New general capability requirements – Bluetooth NC CP – Power saving modes

If the NC-PS bearer level power saving scheme is supported and the network link is in 'Standby' mode, then the MHD device should request the transition from 'Standby' to 'Active' NC-PS mode before any required link protection communication.

S	A	n/a	M-DMS M-DMP	n/a	IEC 62481-1	67G8Y	
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Refer to IEC 62481-1, 7.2.3.4.3.

This is to ensure that the link is in the highest bandwidth and lowest delay state before starting a link protection exchange that may depend on the timing of individual message. For example, DTCP-IP measures the RTT between the content source and the content receiver to determine if the endpoints are on the user's home network. If this operation occurs while the link is in the 'Standby' mode, the delay can be artificially high.