

INTERNATIONAL STANDARD

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**Digital living network alliance (DLNA) home networked device interoperability guidelines –
Part 4: DRM interoperability solutions**

**Directives d'interopérabilité des dispositifs de réseau domestique DLNA (digital living network alliance) –
Partie 4: Solutions d'interopérabilité de gestion des droits numériques**



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IEC Central Office
3, rue de Varembe
CH-1211 Geneva 20
Switzerland

Tel.: +41 22 919 02 11
Fax: +41 22 919 03 00
info@iec.ch
www.iec.ch

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Part 4: DRM interoperability solutions**

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

**DIGITAL LIVING NETWORK ALLIANCE (DLNA) HOME
NETWORKED DEVICE INTEROPERABILITY GUIDELINES –**
Part 4: DRM interoperability solutions

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FDIS	Report on voting
100/2250/FDIS	100/2286/RVD

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 stability 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

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INTRODUCTION

Consumers are acquiring, viewing, and managing an increasing amount of digital media (photos, music, and video) on devices in the Consumer Electronics (CE), mobile, and Personal Computer (PC) domains. As such, they want to conveniently enjoy the content, regardless of the source, across different devices and locations in the home. The digital home vision integrates the Internet, mobile, and broadcast networks through a seamless, interoperable network, which will provide a unique opportunity for manufacturers and consumers alike. In order to cater for this need, a common set of industry design guidelines is needed that allows vendors to participate in a growing marketplace, leading to more innovation, simplicity, and value for consumers. This International Standard serves that purpose and provides vendors with the information needed to build interoperable networked platforms and devices for the digital home.

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

Part 4: DRM interoperability solutions

1 Scope

This part of IEC 62481 specifies DLNA guidelines for DRM interoperability.

The set of guidelines in this part of IEC 62481 are based on DLNA DRM Interoperability Solutions (DIS), which are defined as methods to enable the secure transfer and use of protected commercial content among different implementations on network media devices. This content could be protected by different content protection technologies. In this standard they are referred to as DRMs.

The guidelines are not intended to replace or disable other interoperability mechanisms that could already be in place, e.g. DLNA Link Protection guidelines stated in IEC 62481-3 or mechanisms provided by underlying DRMs.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 62481-1:2013, *Digital Living Network Alliance (DLNA) home networked device interoperability guidelines – Part 1: Architecture and protocols*

IEC 62481-2:2013, *Digital Living Network Alliance (DLNA) home networked device interoperability guidelines – Part 2: DLNA media formats*

IEC 62481-3:2013, *Digital Living Network Alliance (DLNA) home networked device interoperability guidelines – Part 3: Link protection*

ISO/IEC 29341-3-12, *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 1.51: October 1, 2007
http://www.dtcp.com/data/info_20071001_DTCP_V1_1p51.pdf

DTCP Volume 1 Supplement E (Informational Version), *Mapping DTCP to IP*, Revision 1.2: June 15, 2007
http://www.dtcp.com/data/info_20070615_DTCP_V1SE_1p2.pdf

DTCP Adopter Agreement, *Digital Transmission Content Protection License Agreement, DTLA*, June 30, 2007
<http://www.dtcp.com/>

3 Terms, definitions and abbreviated terms

For the purposes of this document, the terms and definitions, symbols and abbreviations given in IEC 62481-1:2013, as well as the following apply.

3.1 Terms and definitions

3.1.1

copy

propagating content from a source device to a destination device such that the source device maintains its original version of this content

3.1.2

move

propagating content from a source device to a destination device such that the source device no longer maintains a usable copy of this content

3.2 Abbreviated terms

3.2.1

DRM Interoperability System

DIS

a means for content to be protected by DRM A on one device to be transformed to the same content protected by DRM B on another device

3.2.2

Digital Rights Management

DRM

system for protecting the copyrights of electronic digital media

3.2.3

Digital Transmission Content Protection over Internet Protocol Digital Rights Management Interoperability System

DTCP-IP DIS

DIS implemented according to the DTCP-IP specification

3.3 Conventions

In IEC 62481-1:2013 and this standard, a number of terms, conditions, mechanisms, sequences, parameters, events, states, or similar terms are printed with the first letter of each word in uppercase and the rest lowercase (e.g., Move). Any lowercase uses of these words have the normal technical English meanings.

4 Networking architecture, device models and guideline conventions

4.1 DLNA home networking architecture

See IEC 62481-1:2013, Clause 4, for a full description of the DLNA home networking architecture.

4.2 DLNA device model

See IEC 62481-1:2013, Clause 5, for a full description of the DLNA device model. This standard extends the existing DLNA Device Classes and Device Capabilities to include protected content used for the following System Usages:

- Upload System Usage;
- Download System Usage;

- Upload Synchronization System Usage;
- Download Synchronization System Usage.

4.3 Guideline terminology and conventions

See IEC 62481-1:2013, Clause 6, for a full description of the DLNA document conventions.

5 Guideline requirements

5.1 General

See 7.1.1 in IEC 62481-1:2013, for guideline and attribute table layout descriptions.

5.2 Common DRM interoperability guidelines

5.2.1 General

This standard defines the usage guidance for the DTCP-IP DLNA DIS technology. For convenience, the term “DTCP-IP DIS” is used to mean the DTCP-IP technology for a DLNA DIS.

DTCP-IP DIS provides Copy and Move functionality by means of the transcription interoperability scenario. DTCP-IP DIS supports the Upload System Usage, Download System Usage, Upload Synchronization System Usage, and Download Synchronization System Usage.

5.2.2 Media management – MM/CP additional MM flags-param (flags parameter)

[GUIDELINE] The primary-flags token as defined in 7.4.1.3.23.2 (GUN 3WJUJ) of IEC 62481-1:2013, are extended for DLNA DIS with additional bit mappings. The additional bit mappings of primary-flags for DLNA DIS shall be as follows.

- Bit 31 to Bit 14 are as defined in 7.4.1.3.23.2 (GUN 3WJUJ) of IEC 62481-1:2013.
- Bit 13: DIS-DTCP-copy flag (DTCP-IP DIS Copy flag)
 - applies only to the HTTP Media Transport;
 - if the flags-param is omitted then this flag shall have an inferred value of false;
 - see guidelines 5.3.2.2.2 and 5.3.2.2.3 for more information.
- Bit 12: DIS-DTCP-move flag (DTCP-IP DIS Move flag)
 - applies only to the HTTP Media Transport;
 - if the flags-param is omitted then this flag shall have an inferred value of false;
 - see guidelines 5.3.2.3.2 and 5.3.2.3.3 for more information.

All other bits in primary-flags are reserved for future use and shall have a value of false.

[ATTRIBUTES]

M	A	DMS DMP DMC DMR DMP+ +DN+ +UP+ +PU+ +PR1+ +PR2+ +UPSYNC+ +DNSYNC+	M-DMS M-DMP M-DMD M-DMC M-DMU	MIU	IEC 62481-1	N3J8N	N
---	---	---	-------------------------------------	-----	-------------	-------	---

5.2.3 DRM interoperability technology guidelines requirements – DTCP-IP DIS support

5.2.3.1

[GUIDELINE] A UPnP AV MediaServer or UPnP AV MediaServer control point may implement DTCP-IP DIS.

[ATTRIBUTES]

O	A	DMS +DN+ +UP+ +UPSYNC+ +DNSYNC+	M-DMS M-DMD M-DMU	n/a	n/a	BI2KZ	N
---	---	---------------------------------------	----------------------	-----	-----	-------	---

[COMMENT] Implementation of the DTCP-IP DIS guidelines is optional in DLNA.

5.2.3.2

[GUIDELINE] If a UPnP AV MediaServer or UPnP AV MediaServer control point implements the DTCP-IP DIS, then it shall conform to all of the guidelines as defined in 5.3.

[ATTRIBUTES]

M	A	DMS +DN+ +UP+ +UPSYNC+ +DNSYNC+	M-DMS M-DMD M-DMU	n/a	n/a	NYTO8	N
---	---	---------------------------------------	----------------------	-----	-----	-------	---

5.3 DTCP-IP DIS guidelines

5.3.1 General

This subclause contains the guidelines that are specific to the DTCP-IP DIS. Annex A provides the high level description on how the DTCP-IP DIS works in DLNA and some examples of DTCP-IP DIS sequence to enable a better understanding of this subclause.

5.3.2 Media management

5.3.2.1 MM/CP res@dtcp:uploadInfo property

[GUIDELINE] If a UPnP AV MediaServer control point attempts to upload content using the DTCP-IP Move Protocol, as specified in V1SE.8.4 of DTCP Volume 1 Supplement E:2007, then it shall provide a res@dtcp:uploadInfo property with a value whose bits 31 and 30 are set to one, as defined in V1SE.10.5.2 of DTCP Volume 1 Supplement E:2007 with the CDS:CreateObject request.

[ATTRIBUTES]

M	A	+UP+ +UPSYNC+	M-DMU	n/a	ISO/IEC 29341-3-12 DTCP Volume 1 DTCP Volume 1 Supplement E	JE3NY	N
---	---	---------------	-------	-----	---	-------	---

[COMMENT] The use of the res@dtcp:uploadInfo property is recommended (optional) in DTCP Volume 1 Supplement E, but in order to provide interoperability this is mandated by this guideline.

5.3.2.2 MM/CP DIS DTCP-copy-flag (DTCP-IP DIS Copy flag)

5.3.2.2.1

[GUIDELINE] The flag is set in accordance with usage rule (Copy Control Information) associated with the content binary and DTCP compliance rules in DTCP Adopter Agreement.

In the case of Upload System Usage, this flag can be returned in the CMS:GetProtocollInfo response, but Upload Controller or M-DMU or +UPSYNC+ cannot rely on this flag to check on availability of DTCP-IP DIS Copy function on the Receiving Endpoint.

5.3.2.2.2

[GUIDELINE] If a UPnP AV MediaServer exposes a content binary that is available for Copy using DTCP-IP DIS, then the DIS-DTCP-copy flag in guideline 5.2.2 of this content item's res@protocollInfo property shall be set to true.

[ATTRIBUTES]

M	A	DMS	M-DMS	n/a	IEC 62481-1 ISO/IEC 29341-3-12	K6IWN	N
---	---	-----	-------	-----	--------------------------------------	-------	---

5.3.2.2.3

[GUIDELINE] If a UPnP AV MediaServer exposes a content binary that is not available for Copy using DTCP-IP DIS, then the DIS-DTCP-copy flag in guideline 5.2.2 of this content item's res@protocollInfo property shall be set to false.

[ATTRIBUTES]

M	A	DMS	M-DMS	n/a	IEC 62481-1 ISO/IEC 29341-3-12	2CC5J	N
---	---	-----	-------	-----	--------------------------------------	-------	---

5.3.2.3 MM/CP DIS-DTCPmove flag (DTCP-IP DIS Move flag)

5.3.2.3.1

[GENERAL] This flag is set in accordance with usage rule (copy control information) associated with the content binary and DTCP COMPLIANCE RULES in DTCP Adopter Agreement.

This flag needs to be consistent with the DTCP-IP content flags (DTCP.COM_FLAGS) defined in V1SE.10.5.1 of DTCP Volume 1 Supplement E if DTCP.COM_FLAGS is included as an other-param of 4th field in res@protocollInfo property. For example, if the UPnP AV mediaserver sets the DIS-DTCP-move flag in the DLNA.ORG_FLAGS to true and use DTCP.COM_FLAGS for Move capability, then the bits 31 and 30 of the DTCP.COM_FLAGS shall to be set to one.

In the case of Upload System Usage, this flag can be returned in the CMS:GetProtocollInfo response, but Upload Controller or M-DMU or +UPSYNC+ cannot rely on this flag to check on availability of DTCP-IP DIS Move function on the Receiving Endpoint.

5.3.2.3.2

[GUIDELINE] If a UPnP AV MediaServer exposes a content binary that is movable using TCP-IP DIS with DTCP-IP Move Protocol defined in V1SE.8.4 of DTCP Volume 1 Supplement E:2007, then the DIS-DTCP-move flag in guideline 5.2.2 of this content item's res@protocollInfo property shall be set to true.

[ATTRIBUTES]

M	A	DMS	M-DMS	n/a	IEC 62481-1 ISO/IEC 29341-3-12 DTCP Volume 1 Supplement E	LIJAN	N
---	---	-----	-------	-----	--	-------	---

5.3.2.3.3

[GUIDELINE] If a UPnP AV MediaServer exposes a content binary that is not movable using DTCP-IP DIS with DTCP-IP Move Protocol defined in V1SE.8.4 of DTCP Volume 1 Supplement E:2007, then the DIS-DTCP-move flag in guideline 5.2.2 of this content item's res@protocolInfo property shall be set to false.

[ATTRIBUTES]

M	A	DMS	M-DMS	n/a	IEC 62481-1 ISO/IEC 29341-3-12 DTCP Volume 1 Supplement E	LLDMQ	N
---	---	-----	-------	-----	--	-------	---

5.3.2.4 MM/CP CDS item deletion for moved content

[GUIDELINE] A UPnP AV MediaServer shall destroy the CDS item which represents the content deleted or rendered unusable in the consequence of DTCP-IP Move operation within 30 s of a successful DTCP-IP Move transaction.

[ATTRIBUTES]

M	A	DMS	M-DMS	n/a	ISO/IEC 29341-3-12 DTCP Volume 1 DTCP Volume 1 Supplement E	QJH3A	N
---	---	-----	-------	-----	---	-------	---

5.3.3 Media Transport**5.3.3.1 MT/CP HTTP header: content type (DTCP socket information)**

[GUIDELINE] If an HTTP Client Endpoint attempts to upload content using DTCP-IP DIS, then it shall provide DTCP Socket information in the Content-Type HTTP header field in an HTTP POST request.

[ATTRIBUTES]

M	C	+UP+ +UPSYNC +	M-DMU	n/a	IEC 62481-1 DTCP Volume 1 Supplement E	YPGP3	N
---	---	----------------	-------	-----	---	-------	---

[COMMENT] This guideline specifies the use of content type header with the MIME-type which includes DTCP Socket information in Upload System Usage and Upload Synchronization System Usage.

5.3.3.2 MT/CP HTTP header: BLKMove.dtcp.com

5.3.3.2.1

[GUIDELINE] If an HTTP Server Endpoint receives an HTTP POST request without the message body to the res@importUri property value, which specifies that the content will be received using the DTCP-IP Move protocol, then the endpoint shall include the BLKMove.dtcp.com HTTP header as specified in V1SE.10.4 of DTCP Volume 1 Supplement E:2007 when it returns the HTTP status code of 100 (Continue) in the HTTP POST response.

[ATTRIBUTES]

M	A	DMS	M-DMS	n/a	ISO/IEC 29341-3-12 DTCP Volume 1 Supplement E	K5659	N
---	---	-----	-------	-----	---	-------	---

[COMMENT] The use of BLKMove.dtcp.com HTTP header is recommended (optional) in the DTCP-IP specification DTCP Volume 1 Supplement E, but in order to provide interoperability this is mandated by this guideline. The res@importUri property value is created by the UPnP AV MediaServer when a CDS:CreateObject request was made and returned to the control point in the response to the CDS:CreateObject action.

5.3.3.2.2

[GUIDELINE] If an HTTP Client Endpoint uploads content using the DTCP-IP Move protocol as defined in V1SE.8.4 of DTCP Volume 1 Supplement E with an HTTP POST request, then it shall encrypt the Protected Content Packets (PCPs) using the key specified by the BLKMove.dtcp.com HTTP header of an HTTP POST response with status code 100 (Continue).

[ATTRIBUTES]

M	A	+UP+ +UPSYNC +	M-DMU	n/a	IEC 62481-1 DTCP Volume 1 Supplement E	MKIEQ	N
---	---	----------------	-------	-----	--	-------	---

5.3.3.2.3

[GUIDELINE] If an HTTP Client Endpoint attempts to download a content using the DTCP-IP Move protocol defined in V1SE.8.4 of DTCP Volume 1 Supplement E, then it shall include the BLKMove.dtcp.com HTTP header in the HTTP GET request to specify the key used for the Move Transmission process.

[ATTRIBUTES]

M	A	+UP+ +UPSYNC +	M-DMU	n/a	IEC 62481-1 DTCP Volume 1 Supplement E	TV5QO	N
---	---	----------------	-------	-----	--	-------	---

[COMMENT] Guidelines 5.3.3.2.2 and 5.3.3.2.3 specify the usage of BLKMove.dtcp.com HTTP header recommended in DTCP Volume 1 Supplement E.

5.3.3.2.4

[GUIDELINE] If an HTTP Server Endpoint received an HTTP GET request with the BLKMove.dtcp.com HTTP header to a content binary exposed with the DIS-DTCP-move flag set to true as specified in guideline 5.3.2.3.2, then it shall encrypt the Protected Content Packets (PCPs) using the key specified by the BLKMove.dtcp.com HTTP header.

[ATTRIBUTES]

M	A	DMS	M-DMS	n/a	ISO/IEC 29341-3-12 DTCP Volume 1 Supplement E	LCD7X	N
---	---	-----	-------	-----	---	-------	---

5.3.3.3 MT/CP content transfer ready for Copy**5.3.3.3.1**

[GUIDELINE] If an HTTP Server Endpoint received an HTTP POST request without the message body to the `res@importUri` property value for Copy using DTCP-IP DIS, then the endpoint should return an HTTP status code of 100 (Continue) only after successful completion of a DTCP-IP AKE.

[ATTRIBUTES]

S	A	DMS	M-DMS	n/a	IEC 62481-1 DTCP Volume 1 DTCP Volume 1 Supplement E	VGMDQ	N
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[COMMENT] The `res@importUri` property value for Copy using DTCP-IP DIS signifies the URI that was included in the response following a CDS:CreateObject request with the `res@dtcp:uploadInfo` property, and that has a value with bit 31 is set to zero or without `res@dtcp:uploadInfo` property.

5.3.3.3.2

[GUIDELINE] If an HTTP Client Endpoint attempts to acquire content using the DTCP-IP DIS Copy, then it should perform the DTCP-IP AKE that is necessary to decrypt the received content before establishing the HTTP connection with the HTTP Server Endpoint.

[ATTRIBUTES]

S	A	+DN+ +DNSYNC+	M-DMD	n/a	IEC 62481-1 DTCP Volume 1 DTCP Volume 1 Supplement E	ASRQS	N
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[COMMENT] Guidelines 5.3.3.3.1 and 5.3.3.3.2 correspond to 7.6.3.2 (GUN R6EOV) CP: Play Ready guideline in IEC 62481-3:2013.

5.3.3.4 MT/CP DTCP-IP AKE for Move**5.3.3.4.1**

[GUIDELINE] If an HTTP Server Endpoint received an HTTP POST request without the message body to the `res@importUri` property value for Move using DTCP-IP DIS, then it shall return an HTTP status code of 100 (Continue) only after successful completion of a Move RTT-AKE defined in V1SE.8.4.1 of DTCP Volume 1 Supplement E:2007.