BS EN 62481-4:2014

BSI Standards Publication

# Digital living network alliance (DLNA) home networked device interoperability guidelines

Part 4: DRM interoperability solutions (TA9)

bsi.

...making excellence a habit.™

## National foreword

This British Standard is the UK implementation of EN 62481-4:2014. It is identical to IEC 62481-4:2014.

The UK participation in its preparation was entrusted to Technical Committee EPL/100, Audio, video and multimedia systems and equipment.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.


Published by BSI Standards Limited 2014

ISBN 978 0 580 79852 8
ICS 33.160.01; 35.100.05; 35.110

**Compliance with a British Standard cannot confer immunity from legal obligations.**

This British Standard was published under the authority of the Standards Policy and Strategy Committee on 30 June 2014.

### Amendments/corrigenda issued since publication

| Date | Text affected |
|---|---|

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

**EN 62481-4**

May 2014

ICS 33.160; 35.100.05; 35.110

English Version

# Digital living network alliance (DLNA) home networked device interoperability guidelines - Part 4: DRM interoperability solutions (TA9) (IEC 62481-4:2014)

Directives d'Interopéabilité des dispositifs de réseau domestique DLNA (DIGITAL LIVING NETWORK ALLIANCE) - Partie 4: Solutions d'interopérabilité de gestion des droits numériques (CEI 62481-4:2014)

Digital living network alliance (DLNA) Interoperabilitäts-Richtlinien für Geräte im Heimnetzwerk - Teil 4: Digitale Rechte Management (DRM) Interoperabilitätslösungen (IEC 62481-4:2014)

This European Standard was approved by CENELEC on 2014-04-10. 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 CEN-CENELEC Management Centre 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 CEN-CENELEC Management Centre 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, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.


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

**CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels**

## Foreword

The text of document 100/2250/FDIS, future edition 1 of IEC 62481-4, prepared by technical area 9, "Audio, video and multimedia applications for end-user network", of IEC/TC 100, "Audio, video and multimedia systems and equipment" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 62481-4:2014.

The following dates are fixed:

| | | |
|---|---|---|
| • latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement | (dop) | 2015-01-10 |
| • latest date by which the national standards conflicting with the document have to be withdrawn | (dow) | 2017-04-10 |

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

## Endorsement notice

The text of the International Standard IEC 62481-4:2014 was approved by CENELEC as a European Standard without any modification.

# Annex ZA
(normative)
## Normative references to international publications with their corresponding European publications

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.

NOTE 1 When an International Publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

NOTE 2 Up-to-date information on the latest versions of the European Standards listed in this annex is available here: www.cenelec.eu

| Publication | Year | Title | EN/HD | Year |
|---|---|---|---|---|
| IEC 62481-1 | 2013 | Digital living network alliance (DLNA) home networked device interoperability guidelines -- Part 1: Architecture and protocols | EN 62481-1 | 2014 |
| IEC 62481-2 | 2013 | Digital living network alliance (DLNA) home networked device interoperability guidelines -- Part 2: DLNA media formats | EN 62481-2 | 2014 |
| IEC 62481-3 | 2013 | Digital living network alliance (DLNA) home networked device interoperability guidelines -- Part 3: Link protection | EN 62481-3 | 2014 |
| ISO/IEC 29341-3-12 | - | Information technology -- UPnP Device Architecture -- Part 3-12: Audio Video Device Control Protocol - Content Directory Service | - | - |
| DTCP Adopter Agreement | - | Digital Transmission Content Protection License Agreement | - | - |
| DTCP Volume 1 Supplement E | - | Mapping DCTP to IP | - | - |
| DTCP Volume 1 | - | Digital transmission content protection specification | - | - |

# CONTENTS

# 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.

# 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 3WJUU) 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 3WJUU) 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 DMPr +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:GetProtocolInfo 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@protocolInfo 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@protocolInfo 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@protocolInfo 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:GetProtocolInfo 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@protocolInfo property shall be set to true.

**[ATTRIBUTES]**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| M | A | DMS | M-DMS | n/a | IEC 62481-1<br>ISO/IEC 29341-3-12<br>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<br>ISO/IEC 29341-3-12<br>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<br>DTCP Volume 1<br>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<br>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 |

**[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 |

**[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.

**[ATTRIBUTES]**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| M | C | DMS | M-DMS | n/a | IEC 62481-1 DTCP Volume 1 Supplement E | LKUA7 | N |

**[COMMENT]** The res@importUri property value for Move using DTCP-IP DIS means the URI that was included in the response following a CDS:CreateObject request with the res@dtcp:uploadInfo property specified in guideline 5.3.2.1.

**5.3.3.4.2**

**[GUIDELINE]** If an HTTP Client Endpoint attempts to acquire content using the DTCP-IP Move protocol defined in V1SE.8.4 of DTCP Volume 1 Supplement E, then it shall perform the Move RTT-AKE before establishing an HTTP connection with the HTTP Server Endpoint for the Move transaction.

**[ATTRIBUTES]**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| M | C | +DN+ +DNSYNC+ | M-DMD | n/a | IEC 62481-1 DTCP Volume 1 Supplement E | T8EAW | N |

**[COMMENT]** Guidelines 5.3.3.4.1 and 5.3.3.4.2 correspond to 7.6.3.2 (GUN R6EOV) CP: Play Ready guideline in IEC 62481-3:2013 in the case of DTCP-IP Move operation.

### 5.3.4 DTCP profiling guidelines

#### 5.3.4.1 CP DTCP-IP: profile

**5.3.4.1.1**

**[GUIDELINE]** If a UPnP AV MediaServer or UPnP AV MediaServer control point applies DTCP-IP DIS for the Upload and/or Download System Usages, then it shall follow the requirements set forth in 8.8 in IEC 62481-3:2013.

**[ATTRIBUTES]**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| M | R | DMS +UP+ +DN+ | M-DMS M-DMU M-DMD | n/a | IEC 62481-3 DTCP Volume 1 DTCP Volume 1 Supplement E | 7P7E5 | N |

**5.3.4.1.2**

**[GUIDELINE]** If a UPnP AV MediaServer or UPnP AV MediaServer control point applies DTCP-IP DIS for the Upload Synchronization and/or Download Synchronization System Usages, then it shall follow the guidelines set forth in 8.8 in IEC 62481-3:2013.

**[ATTRIBUTES]**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| M | R | DMS +UPSYNC+ +DNSYNC+ | M-DMS | n/a | IEC 62481-3 DTCP Volume 1 DTCP Volume 1 Supplement E | OIRWP | N |

### 5.3.5 DTCP-IP DIS requirements

#### 5.3.5.1 CP DTCP-IP Move protocol

**5.3.5.1.1**

**[GUIDELINE]** If a UPnP AV MediaServer or a UPnP AV MediaServer control point implements Move of a content using the DTCP-IP DIS in conjunction with the Upload and/or Download System Usages, then it shall be capable of performing DTCP-IP Move protocol defined in V1SE.8.4 of DTCP Volume 1 Supplement E:2007.

**[ATTRIBUTES]**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| M | A | DMS +UP+ +DN+ | M-DMS M-DMU M-DMD | n/a | IEC 62481-1 DTCP Volume 1 DTCP Volume 1 Supplement E | 5T8TQ | N |

**5.3.5.1.2**

**[GUIDELINE]** If a UPnP AV MediaServer or a UPnP AV MediaServer control point implements Move of a content using the DTCP-IP DIS in conjunction with the Upload Synchronization and/or Download Synchronization System Usages, then it shall be capable of performing DTCP-IP Move protocol defined in V1SE.8.4 of DTCP Volume 1 Supplement E:2007.

**[ATTRIBUTES]**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| M | A | DMS +UPSYNC+ +DNSYNC+ | M-DMS | n/a | IEC 62481-1 DTCP Volume 1 DTCP Volume 1 Supplement E | AJRBZ | N |

#### 5.3.5.2 CP determining DTCP-IP DIS Move/Copy support

**5.3.5.2.1**

**[GUIDELINE]** A UPnP AV MediaServer that implements Copy of a content using the DTCP-IP DIS shall include the <dlna:X_DLNACAP> element (as a child of the <device> element that represents the UPnP AV MediaServer) in the device description document and include the Capability ID “dtcp-copy” in the element's comma-separated value list.

**[ATTRIBUTES]**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| M | A | DMS | M-DMS | n/a | IEC 62481-1 DTCP Volume 1 Supplement E | QHZKN | N |

**[COMMENT]** Capability ID “dtcp-copy” indicates support for Copy using DTCP-IP DIS as device level. So, even though a UPnP AV MediaServer indicates “dtcp-copy” in the <dlna:X_DLNACAP> element, it can refuse Copy of a content using DTCP-IP DIS for each content level since DLNA Media Format profile of the specific content is unavailable for uploading to the particular storage, etc. See guideline 7.3.2.35.1 (GUN WJUQC) in IEC 62481-1:2013 for the formal syntax of the <dlna:X_DLNACAP> element. A sample description is given below:

```
<dlna:X_DLNACAP
xmlns:dlna="urn:schemas-dlna-org:device-1-0">av-upload,dtcp-copy</dlna:X_DL
NACAP>
```

**5.3.5.2.2**

**[GUIDELINE]** A UPnP AV MediaServer that implements Move of a content using the DTCP-IP DIS with DTCP-IP Move protocol defined in V1SE.8.4 of DTCP Volume 1 Supplement E:2007 shall include the <dlna:X_DLNACAP> element (as a child of the <device> element that represents the UPnP AV MediaServer) in the device description document and include the Capability ID “dtcp-move” in the element's comma-separated value list.

**[ATTRIBUTES]**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| M | A | DMS | M-DMS | n/a | IEC 62481-1 DTCP Volume 1 Supplement E | PHWOP | N |

**[COMMENT]** Capability ID “dtcp-move” indicates support for Move using DTCP-IP DIS with DTCP-IP Move Protocol defined in V1SE.8.4 of DTCP Volume 1 Supplement E:2007 as device level. So, even though a UPnP AV MediaServer indicates “dtcp-move” in the <dlna:X_DLNACAP> element, it can refuse Move of a content using DTCP-IP DIS for each content level since DLNA Media Format profile of the specific content is unavailable for uploading to the particular storage, etc. See guideline 7.3.2.35.1 (GUN WJUQC) in IEC 62481-1:2013 for the formal syntax of the <dlna:X_DLNACAP> element. A sample description is given below:

```
<dlna:X_DLNACAP
xmlns:dlna="urn:schemas-dlna-org:device-1-0">av-upload,dtcp-move</dlna:X_DL
NACAP>
```

If a UPnP AV MediaServer supports both Move and Copy using DTCP-IP DIS, the sample description is as follows:

```
<dlna:X_DLNACAP
xmlns:dlna="urn:schemas-dlna-org:device-1-0">av-upload,dtcp-move,dtcp-copy<
/dlna:X_DLNACAP>
```

### 5.3.5.3 CP DTCP-IP Resumption of Move Commitment

**5.3.5.3.1**

**[GUIDELINE]** A UPnP AV MediaServer or a UPnP AV MediaServer control point that implements Move of a content using DTCP-IP DIS should implement Resumption of Move Commitment defined in V1SE.8.4.3.1 of DTCP Volume 1 Supplement E:2007.

**[ATTRIBUTES]**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| S | A | DMS +UP+ +DN+ +UPSYNC+ +DNSYNC+ | M-DMS M-DMU M-DMD | n/a | IEC 62481-1 DTCP Volume 1 Supplement E | 96VJ3 | N |

**[COMMENT]** Implementing this functionality helps to improve user experience when an interruption of Move Commitment process has occurred by loss of TCP connection.

**5.3.5.3.2**

**[GUIDELINE]** A UPnP AV MediaServer that implements the Resumption of Move Commitment as defined in V1SE.8.4.3.1 of DTCP Volume 1 Supplement E:2007 shall include the <dlna:X_DLNACAP> element (as a child of the <device> element that represents the UPnP AV MediaServer) in the device description document and include the Capability ID “dtcp-move-resumption” in the element's comma-separated value list.

**[ATTRIBUTES]**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| M | A | DMS | M-DMS | n/a | IEC 62481-1 DTCP Volume 1 Supplement E | V6NSW | N |

**[COMMENT]** AV MediaServer devices use the <dlna:X_DLNACAP> element to indicate support for Resumption of Move Commitment operation. The element is a comma separated value list that indicates whether the AV MediaServer is capable of resumption of move commitment operation, receive uploads of images, audio-only, or audio/video content, etc. See guideline 7.3.2.35.1 (GUN WJUQC) in IEC 62481-1:2013 for the formal syntax of the <dlna:X_DLNACAP> element. A sample description is given below:

```
<dlna:X_DLNACAP
xmlns:dlna="urn:schemas-dlna-org:device-1-0">av-upload,srs-conflict-resolut
ion,dtcp-move,dtcp-move-resumption</dlna:X_DLNACAP>
```

**5.3.5.3.3**

**[GUIDELINE]** If a UPnP AV MediaServer or a UPnP AV MediaServer control point implements the Resumption of Move Commitment defined in V1SE.8.4.3.1 of DTCP Volume 1 Supplement E:2007, then it shall conform to all guidelines as defined in 5.3.5.4.1 through 5.3.5.4.5.

**[ATTRIBUTES]**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| M | A | DMS +UP+ +UPSYNC+ | M-DMS M-DMU | n/a | IEC 62481-1 DTCP Volume 1 Supplement E | 3THT6 | N |

### 5.3.5.4 CP HTTP POST request with DTCP-IP information for Resumption of Move Commitment

**5.3.5.4.1**

**[GUIDELINE]** After the loss of a TCP connection during the Move Commitment process, an HTTP Client Endpoint that performed the Move Transmission but has not completed the Move Commitment process shall send an HTTP POST request to the HTTP Server Endpoint with the DTCP Socket information in accordance with V1SE.8.4.3.1 of DTCP Volume 1 Supplement E:2007.

**[ATTRIBUTES]**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| M | A | +UP+ +UPSYNC+ | M-DMU | n/a | IEC 62481-1 DTCP Volume 1 Supplement E | DQ82O | N |

**[COMMENT]** In case that an IP address and/or a TCP port number of UPnP AV MediaServer control point has been changed after loss of TCP connection, DTCP Socket information is usable to re-establish TCP connection.

**5.3.5.4.2**

**[GUIDELINE]** After the loss of a TCP connection during the Move Commitment process, an HTTP Client Endpoint that performed the Move Transmission, but has not completed the Move Commitment process, shall resend the HTTP POST request of the performed Move Transmission with the following modifications.

- BLKMove.dtcp.com HTTP header is added, as specified in V1SE.10.4 of DTCP Volume 1 Supplement E:2007, which has the key label used during the interrupted Move Commitment process.
- If the UPnP AV MediaServer control point has changed the DTCP Socket after the loss of TCP connection, the DTCP Socket information in the Content-Type HTTP header is updated.

**[ATTRIBUTES]**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| M | A | +UP+ +UPSYNC+ | M-DMU | n/a | IEC 62481-1 DTCP Volume 1 Supplement E | YUM2N | N |

**5.3.5.4.3**

**[GUIDELINE]** When an HTTP Server Endpoint receives an HTTP POST request as defined in guideline 5.3.5.4.1, and it attempts to execute the Resumption of Move Commitment defined in V1SE.8.4.3.1 of DTCP Volume 1 Supplement E:2007, it shall respond with an HTTP error status and the BLKMove.dtcp.com HTTP header that has the key label used during the interrupted Move Commitment process.

**[ATTRIBUTES]**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| M | A | DMS | M-DMS | n/a | IEC 62481-1 DTCP Volume 1 Supplement E | 52OVV | N |

**[COMMENT]** Responding with the HTTP error status means that the UPnP AV MediaServer cannot accept Move Transmission.

**5.3.5.4.4**

**[GUIDELINE]** When an HTTP Server Endpoint receives the HTTP POST request as defined in guideline 5.3.5.4.1 and it cannot execute the Resumption of Move Commitment defined in V1SE.8.4.3.1 of DTCP Volume 1 Supplement E:2007, it shall respond without the BLKMove.dtcp.com HTTP header.

**[ATTRIBUTES]**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| M | A | DMS | M-DMS | n/a | IEC 62481-1 DTCP Volume 1 Supplement E | E42TM | N |

**5.3.5.4.5**

**[GUIDELINE]** In conjunction with guideline 5.3.5.4.3, an HTTP Server Endpoint should respond with an error code of 500 (Internal Server Error).

**[ATTRIBUTES]**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| S | A | DMS | M-DMS | n/a | IEC 62481-1 | RG88L | N |

# Annex A
(informative)

# DTCP-IP DIS behaviour explanations

## A.1 Overview of DTCP-IP DIS behaviour

DTCP-IP DIS is a transcription-based DRM interoperability solution. Figure A.1 depicts the overview of the flow of content and its associated usage rules over DTCP-IP DIS between devices that use different DRMs.

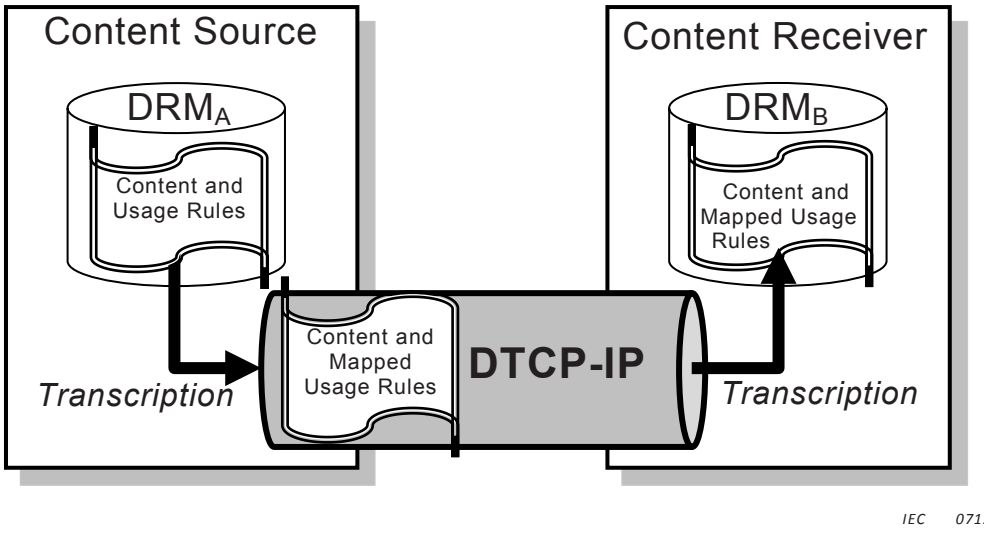


**Figure A.1 – Overview of DTCP-IP DIS Behavior**

The following sequence is an overview of DTCP-IP DIS sequence behavior.

a) In the Content Source, a content and its associated usage rules protected by $DRM_A$ are transcripted into those protected by DTCP-IP.

b) The protected content and the usage rules are transferred over DTCP-IP from the Content Source to the Content Receiver.

c) In the Content Receiver, the content and the usage rules protected by DTCP-IP are transcripted into those protected by $DRM_B$.

As the result of the above sequence, a content and its associated usage rules protected by $DRM_A$ can be transcripted into those protected by $DRM_B$ using DTCP-IP. Therefore, DTCP-IP can act as a DRM Interoperability Solution (DIS) in the above situation.

Note that the availability of DTCP-IP DIS is dependent on the compliance rules of DTCP-IP, $DRM_A$ and $DRM_B$.

## A.2 Example of DTCP-IP DIS sequences

### A.2.1 General

This subclause provides a set of examples, each describing a DTCP-IP DIS protocol sequence in order to facilitate the reader's understanding.

The System Usages using DTCP-IP DIS are described in the following examples, see Figure A.2 to Figure A.5.

- Download System Usage with Copy.
- Download System Usage with Move.
- Upload System Usage with Copy.
- Update System Usage with Move.

### A.2.2 Download Copy sequence

Figure A.2 and the explanation following Figure A.2 describe the Download Copy sequence example.

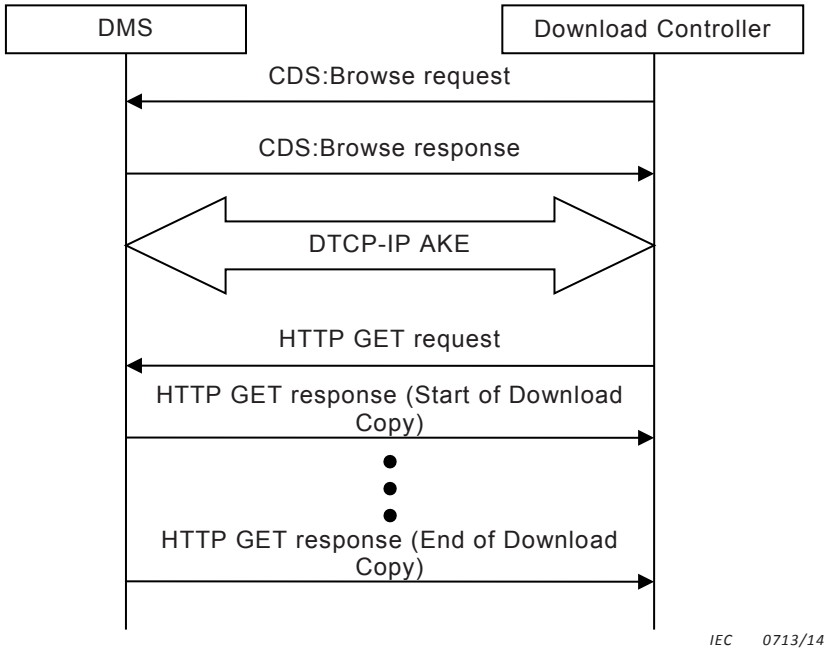


**Figure A.2 – Example of Download Copy sequence**

The following sequence gives the DTCP-IP DIS Download Copy.

- Download Controller obtains URI, DTCP Socket information and availability of DTCP-IP DIS Copy for a specific content by the CDS:Browse action. The availability is indicated by the DIS-DTCP-copy flag in the DLNA.ORG_FLAGS parameter.
- The Download Controller initiates DTCP-IP AKE to that DTCP Socket. As the result of DTCP-IP AKE, a DMS and the Download Controller share an encryption key for a content transfer.
- The Download Controller invokes HTTP GET request to the URI. The DMS sends the corresponding content encrypted using the encryption key shared previously.

### A.2.3 Download Move sequence

Figure A.3 and the explanation following Figure A.3 describe the Download Move sequence example.

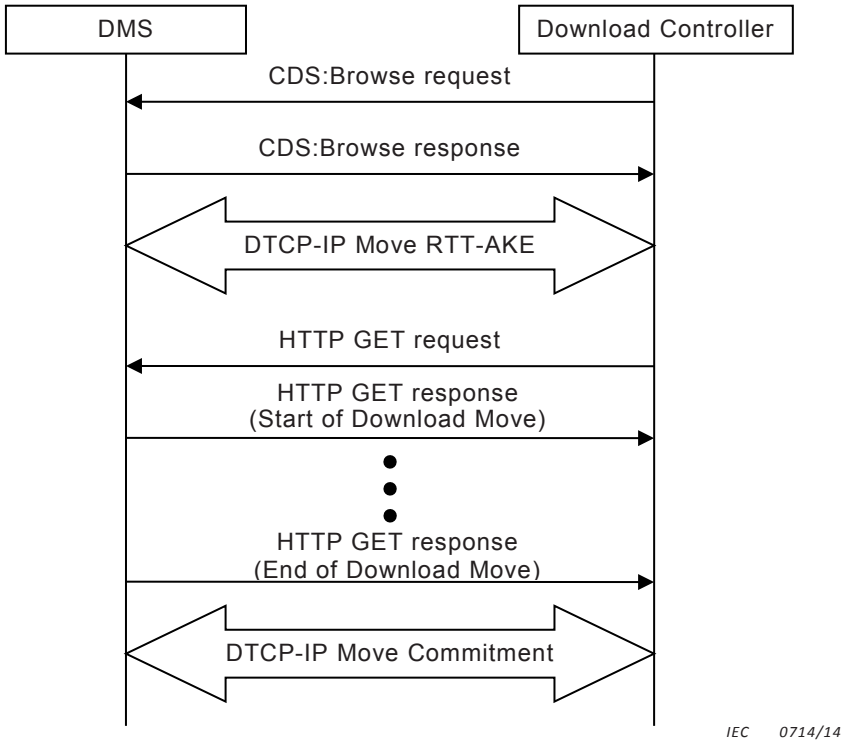


**Figure A.3 – Example of Download Move sequence**

The following sequence gives DTCP-IP DIS Download Move.

- A Download Controller obtains URI, DTCP Socket information and availability of DTCP-IP DIS Move for a specific content by the CDS:Browse action. The availability is indicated by the DIS-DTCP-move flag in DLNA.ORG_FLAGS parameter.
- The Download Controller initiates DTCP-IP Move RTT-AKE to the DTCP Socket. As the result of DTCP-IP Move RTT-AKE, the DMS and the Download Controller share an encryption key for Move Transmission identified by $K_{XM}$_label.
- The Download Controller invokes HTTP GET request with $K_{XM}$_label as a value of BLKMove.dtcp.com HTTP header to the URI. The DMS sends the corresponding content encrypted using the encryption key identified by the $K_{XM}$_label.
- After the Move Transmission completes, the Download Controller initiates DTCP-IP Move Commitment process. As a result of this process, the content on the DMS becomes unusable and the content on the Download Controller becomes usable.

### A.2.4 Upload Copy sequence

Figure A.4 and the explanation following Figure A.4 describe the Upload Copy sequence example.

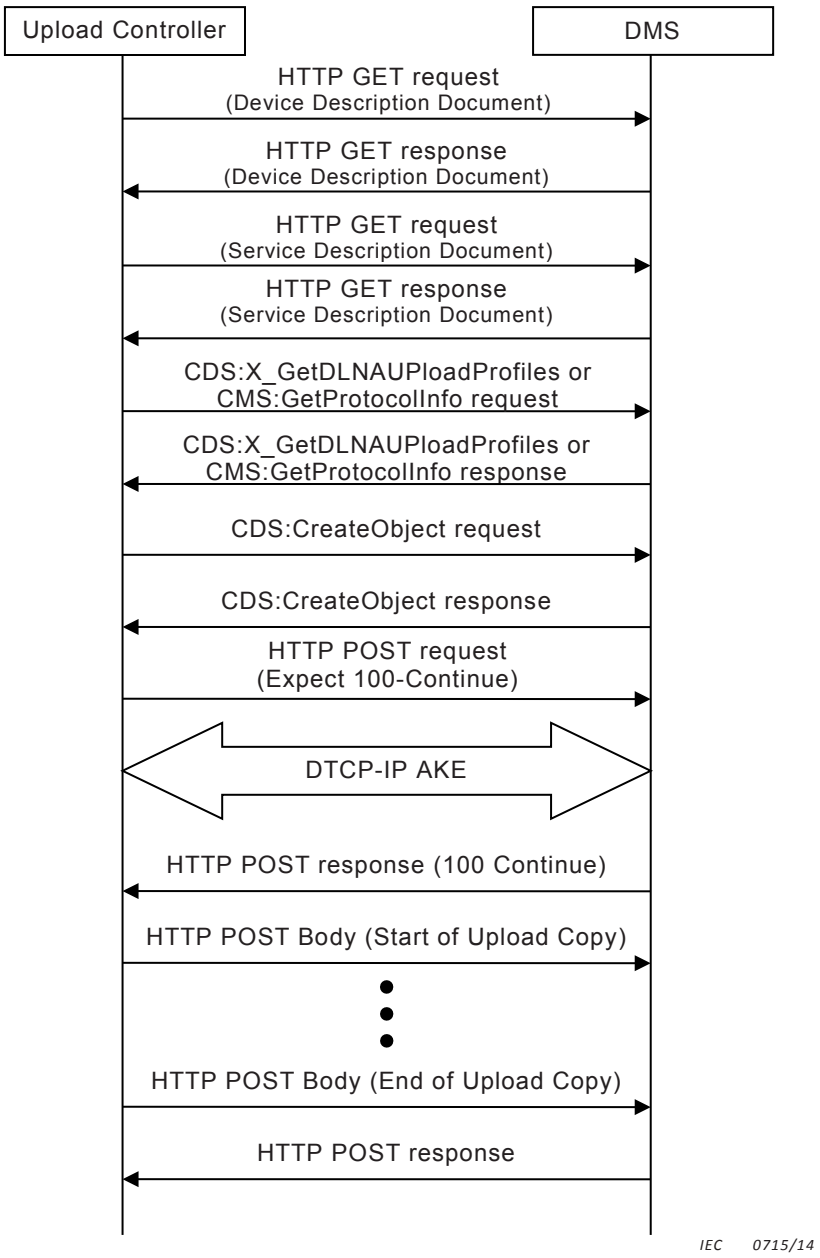


**Figure A.4 – Example of Upload Copy sequence**

The following sequence gives DTCP-IP DIS Upload Copy.

- An Upload Controller obtains Device Description and checks whether a <dlna:X_DLNACAP> element includes the av-upload and dtcp-copy Capability ID in order to know an upload copy capability of a DMS for a content of AV Media Class. Next the Upload Controller obtains Service Description and checks whether the DMS implements CDS:X_GetDLNAUploadProfiles action. If the DMS implements CDS:X_GetDLNAUploadProfiles action, the Upload Controller invokes CDS:X_GetDLNAUploadProfiles request in order to know the acceptable DLNA Media Format Profile ID(s) of the uploading content. If not, the Upload Controller invokes CMS:GetProtocolInfo request.
- The Upload Controller invokes CDS:CreateObject request to create CDS item for a content which will be copied. The DMS returns a URI for HTTP POST with res@importUri property in CDS:CreateObject response.

- To initiate a content transfer, the Upload Controller sends HTTP POST request header to the URI which is a value of the res@importUri property. It includes Content-Type HTTP header with DTCP Socket information.
- The DMS initiates DTCP-IP AKE to that DTCP Socket. As the result of DTCP-IP AKE, the DMS and the Upload Controller share an encryption key for the content transfer, and then the DMS returns the HTTP status code of 100 (Continue).
- The Upload Controller sends the corresponding content encrypted, using the encryption key shared previously to the URI.

### A.2.5 Upload Move sequence

Figure A.5 and the explanation following Figure A.5 describe the Upload Move sequence example.

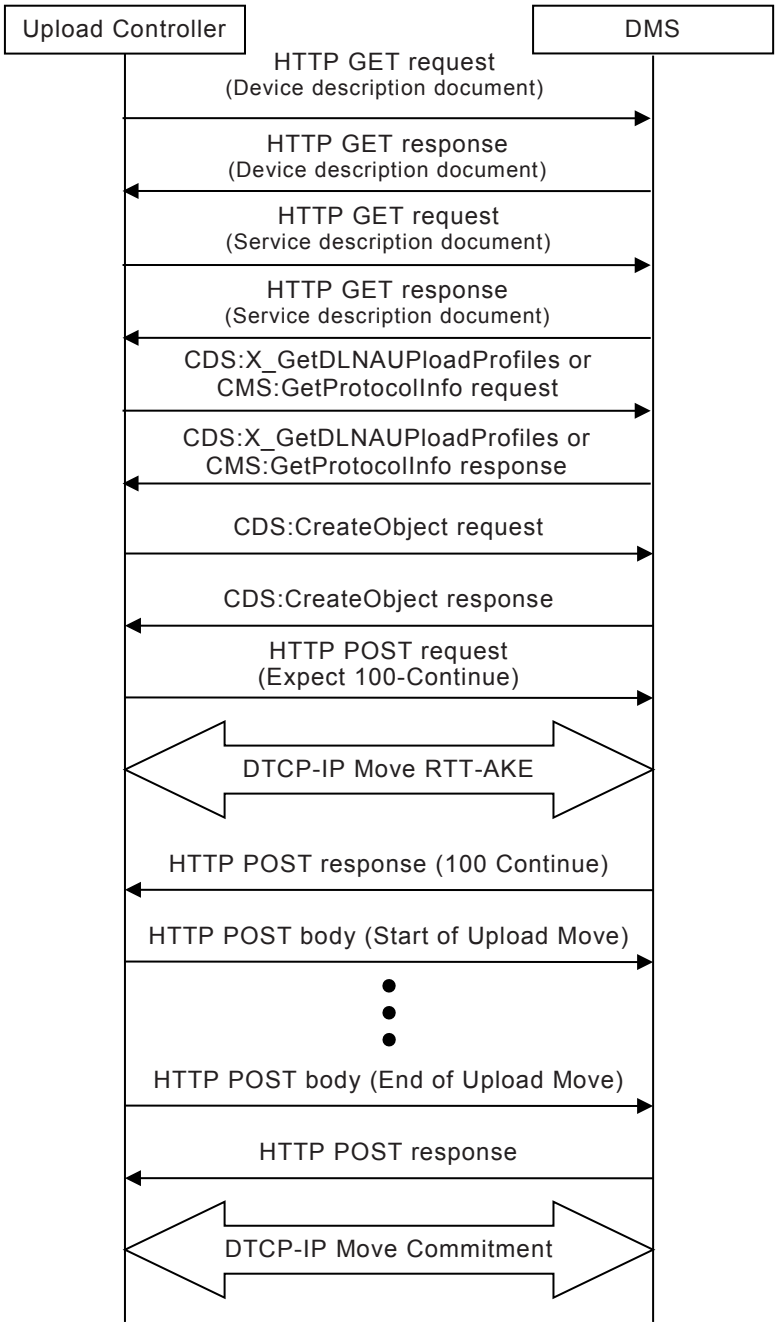


**Figure A.5 – Example of Upload Move sequence**

The following sequence gives DTCP-IP DIS Upload Move.

- An Upload Controller obtains Device Description and checks whether a <dlna:X_DLNACAP> element includes the av-upload and dtcp-move Capability ID in order to know an upload move capability of a DMS for a content of AV Media Class. Next the Upload Controller obtains Service Description and checks whether the DMS implements CDS:X_GetDLNAUploadProfiles action. If the DMS implements CDS:X_GetDLNAUploadProfiles action, the Upload Controller invokes CDS:X_GetDLNAUploadProfiles request in order to know acceptable DLNA Media Format Profile ID(s) of the uploading content. If not, the Upload Controller invokes CMS:GetProtocolInfo request.
- The Upload Controller invokes CDS:CreateObject request to create CDS item for a content which will be moved. The CDS:CreateObject request includes res@dtcp:uploadInfo property

since the subsequent content transfer follows the DTCP-IP Move. The DMS returns a URI for HTTP POST with res@importUri property in CDS:CreateObject response.

- To initiate the Move transaction, the Upload Controller sends HTTP POST request header to the URI which is a value of the res@importUri property. It includes a Content-Type HTTP header with DTCP Socket information.
- The DMS initiates DTCP-IP Move RTT-AKE to the DTCP Socket. As the result of DTCP-IP Move RTT-AKE, the DMS and the Upload Controller share an encryption key for Move Transmission identified by $K_{XM}$_label, and then the DMS returns the HTTP status code of 100 (Continue). It includes BLKMove.dtcp.com HTTP header whose value is the $K_{XM}$_label.
- The Upload Controller sends the corresponding content encrypted using the encryption key identified by the $K_{XM}$_label to the URI.
- After the Move Transmission completes, the DMS initiates DTCP-IP Move Commitment process. As a result of this process, the content on the Upload Controller becomes unusable and the content on the DMS becomes usable.

_____

*This page deliberately left blank*

*This page deliberately left blank*

# British Standards Institution (BSI)

BSI is the national body responsible for preparing British Standards and other standards-related publications, information and services.

BSI is incorporated by Royal Charter. British Standards and other standardization products are published by BSI Standards Limited.

## About us

We bring together business, industry, government, consumers, innovators and others to shape their combined experience and expertise into standards -based solutions.

The knowledge embodied in our standards has been carefully assembled in a dependable format and refined through our open consultation process. Organizations of all sizes and across all sectors choose standards to help them achieve their goals.

## Information on standards

We can provide you with the knowledge that your organization needs to succeed. Find out more about British Standards by visiting our website at bsigroup.com/standards or contacting our Customer Services team or Knowledge Centre.

## Buying standards

You can buy and download PDF versions of BSI publications, including British and adopted European and international standards, through our website at bsigroup.com/shop, where hard copies can also be purchased.

If you need international and foreign standards from other Standards Development Organizations, hard copies can be ordered from our Customer Services team.

## Subscriptions

Our range of subscription services are designed to make using standards easier for you. For further information on our subscription products go to bsigroup.com/subscriptions.

With **British Standards Online (BSOL)** you'll have instant access to over 55,000 British and adopted European and international standards from your desktop. It's available 24/7 and is refreshed daily so you'll always be up to date.

You can keep in touch with standards developments and receive substantial discounts on the purchase price of standards, both in single copy and subscription format, by becoming a **BSI Subscribing Member**.

**PLUS** is an updating service exclusive to BSI Subscribing Members. You will automatically receive the latest hard copy of your standards when they're revised or replaced.

To find out more about becoming a BSI Subscribing Member and the benefits of membership, please visit bsigroup.com/shop.

With a **Multi-User Network Licence (MUNL)** you are able to host standards publications on your intranet. Licences can cover as few or as many users as you wish. With updates supplied as soon as they're available, you can be sure your documentation is current. For further information, email bsmusales@bsigroup.com.

**BSI Group Headquarters**

389 Chiswick High Road London W4 4AL UK

## Revisions

Our British Standards and other publications are updated by amendment or revision.

We continually improve the quality of our products and services to benefit your business. If you find an inaccuracy or ambiguity within a British Standard or other BSI publication please inform the Knowledge Centre.

## Copyright



## Useful Contacts:

**Customer Services**
**Tel:** +44 845 086 9001
**Email (orders):** orders@bsigroup.com
**Email (enquiries):** cservices@bsigroup.com

**Subscriptions**
**Tel:** +44 845 086 9001
**Email:** subscriptions@bsigroup.com

**Knowledge Centre**
**Tel:** +44 20 8996 7004
**Email:** knowledgecentre@bsigroup.com

**Copyright & Licensing**
**Tel:** +44 20 8996 7070
**Email:** copyright@bsigroup.com

bsi.

...making excellence a habit.™