

Discrete Media Specification

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1 Introduction

1.1 Scope

This document specifies requirements and formats for fulfilling the Discrete Media right. It describes requirements for delivery methods and hardware/software clients that record content onto Discrete Media and it lists approved publishing and fulfillment formats.

Discrete Media Clients SHALL be implemented in conformance with this document.

Retailers and DSPs providing Discrete Media fulfillment SHALL implement or use Discrete Media Clients that conform to this document.

Content Providers publishing a DECE DVD ISO Image File or CPRM-protected SD Card File SHALL conform to this document.

1.2 Document Notation and Conventions

The following terms are used to specify conformance elements of this specification. These are adopted from the ISO/IEC Directives, Part 2, Annex H [ISO-P2H]. For more information, please refer to those directives.

- SHALL and SHALL NOT indicate requirements strictly to be followed in order to conform to the document and from which no deviation is permitted.
- SHOULD and SHOULD NOT indicate that among several possibilities one is recommended as particularly suitable, without mentioning or excluding others, or that a certain course of action is preferred but not necessarily required, or that (in the negative form) a certain possibility or course of action is deprecated but not prohibited.
- MAY and NEED NOT indicate a course of action permissible within the limits of the document.

1.3 References

1.3.1 DECE References

[DCoord]	Coordinator Specification
[DSystem]	System Specification

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1.3.2 External References

1.3.2.1 Normative References

[DVD-CSS]	“CSS Procedural Specifications” (see 6.2.9.4 Secure Managed Recording) http://www.dvdcca.org/css/
[DVD-IMG]	“DVD-Video Image File Set for CSS Recording” http://www.dvdforum.org/images/WG-12_9-08_DVD_Image_File_Draft_V1_0-2.pdf
[DVD-IFPED]	DVD-Video Image File Package Electronic Distribution (Draft Specification)
[4C-SDSD]	Content protection for Recordable Media SD Memory Card Book SD-SD (Separate Delivery) Part
[4C-SDV]	Content Protection for Recordable Media SD Memory Card Book SD-SD (Separate Delivery) Video Profile Part
[SDA-SDSD]	SD Association Part 15 SD-SD (Separate Delivery) Specification
[SDA-GP]	SD Association, GreenPlay Metadata Specification

1.3.2.2 Informative References

[DVD-V]	“DVD Specifications for Read-Only Disc Part 3 VIDEO SPECIFICATIONS”
[DVD-DL]	DVD-Download: “DVD Specifications for Download Disc Part 1 PHYSICAL SPECIFICATIONS Ver. 1.0” “DVD Specifications for Download Disc Part 2 FILE SYSTEM SPECIFICATIONS Ver. 1.0” DVD-Download for DL (Dual Layer): “DVD Specifications for Download Disc Part 1 PHYSICAL SPECIFICATIONS Ver. 2.0” “DVD Specifications for Download Disc Part 2 FILE SYSTEM SPECIFICATIONS Ver. 2.0”

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[ISO-P2H]	ISO/IEC Directives, Part 2, Annex H http://www.iec.ch/tiss/iec/Directives-part2-Ed5.pdf
[SDA]	SD Association Part 1 Physical Layer Specification SD Association Part 2 File Systems Specification SD Association Part 3 Security Specification
[4C-SDC]	Content Protection for Recordable Media SD Memory Card Book Common Part
[4C-CCE]	Content Protection for Recordable Media Introduction and Common Cryptographic Elements

2 Overview

2.1 Discrete Media Overview

DECE Content may be sold by a Retailer with or without a Discrete Media Right, which is the ability for a User to receive a version of the Content on physical media in an approved format, such as a CSS-protected DVD or a CPRM-protected SD Card.

Retailers are not obligated to provide a Discrete Media Right or to fulfill it in any specific format, so Users must find a Retailer that provides the format(s) they desire. A Retailer may, if licensed by the Content Provider, sell the Discrete Media Right to a User as an add-on to Content previously sold without the Discrete Media Right.

A Retailer that sells a Discrete Media Right SHALL fulfill it.

The number of allowed Discrete Media is stored in the Rights Token and is limited to DISCRETE_MEDIA_LIMIT (see [DSystem]). The Coordinator provides APIs for checking and consuming (decrementing the count of) Discrete Media Rights and recording a history of the method(s) used to fulfill a Discrete Media Right (see [DCoord]).

There are three models for fulfilling DECE Content on Discrete Media:

1. *Packaged Media*, where the User receives pre-recorded, packaged media containing the Content. This can be done in three ways:
 - a. *Bundled Purchase*, where the Retailer includes DECE rights with purchase of a DVD or Blu-Ray Disc, thus immediately fulfilling the Discrete Media Right at purchase time.
 - b. *Purchase Conversion*, where the Retailer provides a Right based on the User presenting physical media or proof of purchase of physical media, in which case the physical media constitutes a fulfilled Discrete Media Right.
 - c. *Packaged Fulfillment*, where the Retailer or Content Provider delivers packaged media when the User requests fulfillment of a Discrete Media Right.
2. *Retailer Fulfillment* or Retailer Burn, where a Retailer or DSP uses a Discrete Media Client to record the Content to Discrete Media on behalf of a User.
3. *Home Fulfillment* or Home Burn, where a User downloads a file and records onto Discrete Media using a Discrete Media Client.

A Content Provider SHALL provide for at least one of the approved DVD fulfillment options and MAY provide for additional approved options (see Annexes A and B).

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2.1.1 Packaged Media

2.1.1.1 Bundled Purchase or Purchase Conversion

A Bundled Purchase or Purchase Conversion is handled by the Retailer. When the Retailer creates a Rights Token representing a Bundled Purchase or Purchase Conversion, the Retailer SHALL use the `DiscreteMediaRightConsume()` API (see [DCoord] 15.1.6) to indicate that the Discrete Media Right has been consumed by the purchase of physical media or by the presentation of previously obtained physical media.

Other details of how the Bundled Purchase or Purchase Conversion is managed are up to the Retailer and Content Provider and are out of scope of DECE. As examples of Bundled Purchase, the Retailer may connect immediately to the Coordinator from its point-of-sale system, or it may provide a program on a Blu-ray disc that connects directly or indirectly to the Coordinator, or it may provide a Web site where a User can enter a code to activate DECE rights that are then registered in the Coordinator. As an example of Purchase Conversion, the Retailer may provide a “disc to digital” program where it inserts Rights Tokens corresponding to certain DVDs or Blu-ray discs that a User brings into a store or inserts into a disc drive for recognition by a software application.

Note that for Bundled Purchase, the decision of whether or not purchase of a particular piece of physical media includes DECE Content Rights is up to the Content Provider. The Content Provider (or the Retailer, if the given the choice by the Content Provider) may choose not to count the physical purchase toward the Discrete Media Right, in which case the purchase is not considered a DECE Bundled Purchase and the Discrete Media Right (if any) is not consumed when the Rights Token is created.

2.1.1.2 Packaged Fulfillment

Packaged Fulfillment is handled by the Retailer or the Content Provider after initial purchase. When the User requests Discrete Media, the Retailer may deliver packaged media corresponding to the purchased Content, especially if packaged media is the only Discrete Media option supported by the Content Provider.

Before beginning the delivery process, the Retailer SHALL reserve the Discrete Media Right (using `DiscreteMediaRightLeaseCreate()`, see [DCoord] 15.1.3).

Once the packaged media is given or sent to the User, the Retailer SHALL release the lease and consume the Discrete Media Right (using `DiscreteMediaRightLeaseConsume()`, see [DCoord] 15.1.4).

If Retailer needs more time to complete the process than is granted in the lease, it SHALL either use `DiscreteMediaRightLeaseRenew()` before the lease expires or release the lease and create a new lease.

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If necessary, due to a problem with delivery after the Discrete Media Right is consumed, the Retailer MAY update the Rights Token to restore a Discrete Media Right.

2.1.2 Retailer Fulfillment

For Retailer Fulfillment, the Retailer provides the User with the choice to receive one or more forms of Discrete Media at purchase time or after purchase. The Retailer may provide in-store facilities such as kiosks or touch-screen point-of-sale interfaces and behind-the-counter DVD burning or SD Card burning. The Retailer may burn the Discrete Media at a separate facility and ship it to the user.

The Retailer SHALL first use `DiscreteMediaRightLeaseCreate()` (see [DCoord] 15.1.3) to check that an unused Discrete Media Right is available for the relevant Rights Token and to reserve use of the Discrete Media Right. If the lease is successful, the Retailer MAY proceed to create the Discrete Media.

Upon successful creation of the Discrete Media the Retailer SHALL release the lease and consume the Discrete Media Right (using `DiscreteMediaRightLeaseConsume()`, see [DCoord] 15.1.4), informing the Coordinator of the fulfillment method used.

If the Retailer needs more time to complete the process than is granted in the lease, it SHALL either use `DiscreteMediaRightLeaseRenew()` before the lease expires or release the lease and create a new lease.

If necessary, due to failed fulfillment after the Discrete Media Right is consumed, the Retailer MAY update the Rights Token to restore a Discrete Media Right.

2.1.3 Home Fulfillment

For Home Fulfillment, the Discrete Media Client is typically provided by a DSP but may be provided by other DECE Licensees such as a Device Maker that implements it in an Internet-connected DVD recorder or SD Card recorder.

The Discrete Media Client SHALL connect to a DSP to download the Content. The Discrete Media Client may use the Content Download mechanism (see [DSystem] Section 11) or other mechanism out of scope of DECE.

The Discrete Media Client may download a DECE DVD ISO Image File (see Section 5.1) or a CPRM-protected SD Card Image File (see Section 5.2) or may download other file formats out of scope of DECE.

The DSP SHALL first use `DiscreteMediaRightLeaseCreate()` (see [DCoord] 16.3.3) to check that an unused Discrete Media Right is available for the relevant Rights Token and to reserve use of the Discrete Media Right.

If the lease is successful, the DSP SHALL use an appropriate Approved DRM (see 3.1.1) to encrypt the Content and issue a single export or burn license for the desired destination media format.

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The DSP SHALL then release the lease and consume the Discrete Media Right (using `DiscreteMediaRightLeaseConsume()`, see [DCoord] 15.1.4), informing the Coordinator of the fulfillment method used.

The Discrete Media Client is responsible for recording to the media, including retries as necessary. In case of failure the User may have the Discrete Media Right reinstated by the Retailer or by Customer Support.

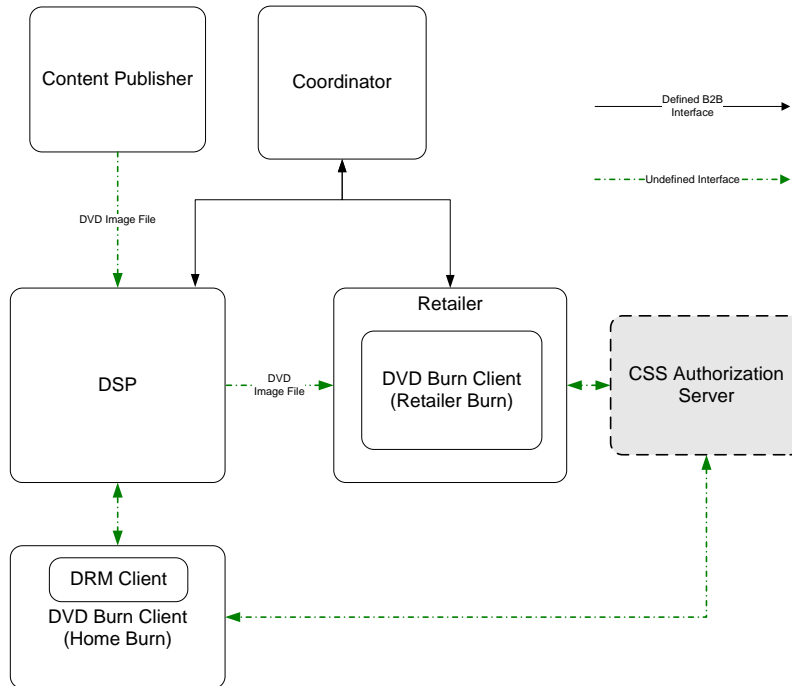


Figure 1 – Example Discrete Media Architecture for DVD Burn

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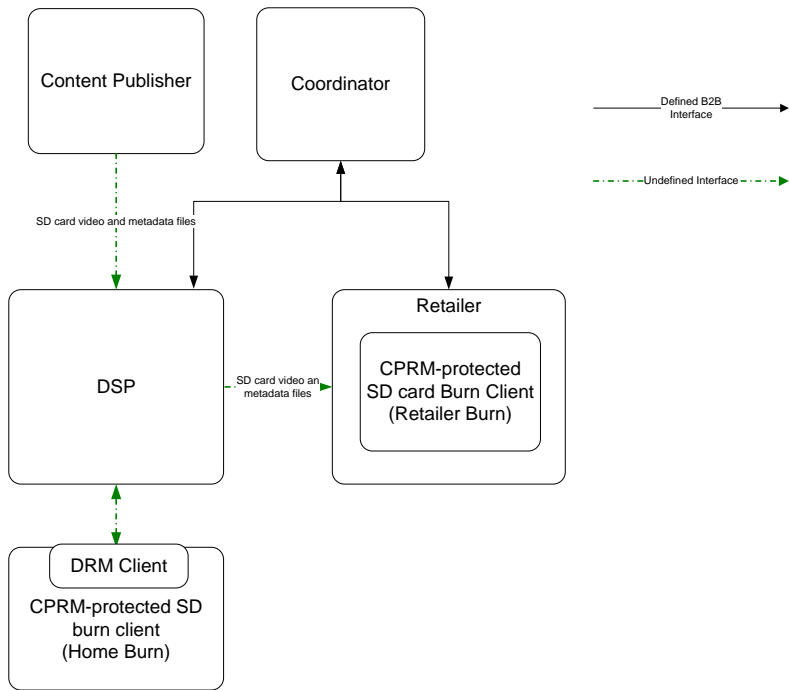


Figure 2 – Example Discrete Media Architecture for CPRM-protected SD Card Burn

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3 Discrete Media Delivery Method

A Discrete Media Delivery Method consists of the overall Content file delivery technology, including everything from back-end storage infrastructure to transmission, reception, and export for recording by the receiving Discrete Media Client.

DSPs SHALL use a Discrete Media Delivery Method from section 3.1 to deliver Content to a Discrete Media Client for Home Fulfillment.

Retailers and DSPs SHALL use a Discrete Media Delivery Method from section 3.1 or 3.2 to deliver Content to a Discrete Media Client for Retailer Fulfillment

Content Providers MAY use any Discrete Media Delivery Method to deliver Content to Retailers or DSPs for Retailer Fulfillment. Note that Content Providers may also use any other method of their choice.

3.1 Discrete Media Delivery Methods for Home or Retailer Fulfillment

A Discrete Media Delivery Method for Home Fulfillment or Retailer Fulfillment SHALL be implemented using either

- an Approved DRM with the capability to export in one or more of the Approved Discrete Media Fulfillment Methods, or
- a CPRM-protected SD Card Image File (see Section 5.2).

3.1.1 Approved DRM

A DRM technology may be used only if it

- a) is an Approved DRM, and
- b) is able to provide an export license or otherwise make a single copy of the DRM-protected Content in a format listed in section 2 or 3 of Annex A (Approved Discrete Media Fulfillment Methods).

The Discrete Media Client is not a DECE Device (although it may be implemented together with a DECE Device) so it may not use a DECE Domain for issuing the export license. Although the DRM technology is approved by DECE for security purposes, it is not used in the same way for Discrete Media recording as for general DECE DRM functions. Therefore, the approved DRM may be used in device-binding mode or media-binding mode. In other words, the DSP may need to have information about the destination media or destination device in order to issue a DRM license binding the content to that specific media or to that specific device with a license to export to the appropriate media.

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3.2 Alternative Discrete Media Delivery Methods for Retailer Fulfillment

A Discrete Media Delivery Method for Retailer Fulfillment (but not Home Fulfillment) may alternatively be implemented in accordance with the requirements set forth in the Retailer or DSP Compliance Rules.

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4 Discrete Media Client

A Discrete Media Client may be implemented by any DECE licensee, although it is typically implemented by a DSP. The Discrete Media Client SHALL only use a conformant Discrete Media Delivery Method to deliver and record Content. Methods of communication between the implementer and the Discrete Media Client are not specified by DECE.

For Retailer Fulfillment, the Discrete Media Client software SHALL be implemented on equipment controlled by the Retailer or DSP or by a party authorized by the Retailer or DSP.

For Home fulfillment, the Discrete Media Client software runs on equipment owned by or available to the User.

5 Discrete Media Package

A Discrete Media Package is the set of Content files delivered using a Discrete Media Delivery Method to a Discrete Media Client to record Discrete Media.

This specification currently defines two Discrete Media Packages: a DECE DVD ISO Image File and a CPRM-protected SD Card File. Discrete Media Clients may use these defined formats or any other data format that can be delivered using a Discrete Media Delivery Method.

5.1 DECE DVD ISO Image File

The Discrete Media Package for a DVD ISO Image enables recording a DVD-Video disc that can be played on the large installed base of DVD players. The DVD Forum specifies a format for file storage of the necessary information to download and record a disc with consumer or professional disc recorders and recordable discs that support the CSS recording feature. The DVD Forum also specifies a method of protecting those files with digital rights management. This document normatively references the DVD Forum specification titled “DVD-Video Image File Set for CSS Recording” [DVD-IMG].

5.1.1 DRM encryption

DECE DVD ISO Image Files SHALL be encrypted in accordance with [DVD-IFPED].

5.2 CPRM-protected SD Card File

The Discrete Media Package for a CPRM-protected SD Card File SHALL be in the format defined by SD Association, GreenPlay Metadata Specification [SDA-GP] and Content protection for Recordable Media SD Memory Card Book SD-SD (Separate Delivery) Part [SD-SDSD].

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Annex A. Discrete Media Fulfillment Methods

Note: This annex may be updated from time to time as new Approved Discrete Media Fulfillment Methods are added.

A.1. List of Approved Discrete Media Fulfillment Methods (ADMFMs)

This list specifies media formats and associated delivery or recording methods that are approved for use to fulfill a Discrete Media Right.

1. Packaged DVD or Blu-ray Media:
 - a. Delivered to the User by mail or other means following purchase of corresponding Content. Content Provider SHALL provide (or arrange provision of) fulfillment service upon Retailer request.
(DiscreteMediaFulfillmentMethod =
urn:dece:type:discretemediainfillment:dvd:packaged)
 - b. Bundled with DECE Rights and purchased from a Retailer or obtained from a Retailer based on prior purchase of the physical media .
(DiscreteMediaFulfillmentMethod =
urn:dece:type:discretemediainfillment:dvd:packaged or
urn:dece:type:discretemediainfillment:bluray:packaged)
2. CSS Recordable DVD-Video:
(DiscreteMediaFulfillmentMethod =
urn:dece:type:discretemediainfillment:dvd:cssrecordable)
 - a. Recorded in a Retailer (kiosk or other method) by a Discrete Media Client.
 - b. Recorded in home by a Discrete Media Client.
 - c. Recorded by a Retailer Discrete Media Client and delivered by mail.
3. CPRM-protected Recordable SD Card with standard definition video:
(DiscreteMediaFulfillmentMethod =
urn:dece:type:discretemediainfillment:securedigital)
 - a. Recorded in store (kiosk or other method) by a Discrete Media Client.
 - b. Recorded in home by a Discrete Media Client.
 - c. Recorded by a Discrete Media Client and delivered by mail.

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A.2. Requirements for CSS Recordable DVD

Discrete Media burning to recordable DVD SHALL be protected with CSS (Content Scramble System) as specified in the Secure Managed Recording provisions of the DVD CCA CSS Procedural Specifications [DVD-CSS]. The CSS Procedural Specifications require the use of special CSS Recordable DVDs and DVD recorders that are compatible with these discs. Once recorded, the DVD will play in standard DVD playback devices. The DVD CCA has approved the DVD-Download Specifications [DVD-DL] of the DVD Forum for this purpose.

A Home Fulfillment Discrete Media Client SHALL use Recordable CSS media pre-written with CSS keys and SHALL connect with Secure Media Recording Server Software (CSS Authorization Server) operated by a Secure Managed Recording Authority to get additional CSS key information necessary to encrypt the DVD image when the disc is burned. This is often called “consumer” CSS recording.

A Retail Fulfillment Discrete Media Client may use the same method as a Home Fulfillment Discrete Media Client or it may operate as a DVD CCA-licensed DVD Disc Replicator using un-keyed “professional” Recordable CSS media and obtaining CSS keys directly from the DVD CCA.

The term Discrete Media Client herein SHALL equate to the term Secure Media Recording Client Software in [DVD-CSS]. The Discrete Media Client SHALL output received Content only in accordance with [DVD-CSS].

A.2.1. DVD Content Protection

The Discrete Media Delivery Method SHALL NOT change the settings for Macrovision ACP as encoded in the ISO image file.

The Discrete Media Client SHALL set the CGMS field in the CPR_MAI on the recorded disc to Copy Never (11b).

A.3. Requirements for CPRM-protected SD Card

A.3.1. CPRM-protected SD Card File Creation

A Content Provider MAY provide a CPRM-protected SD Card File to the Retailer or DSP , or the Retailer or DSP MAY convert Content provided by the Content Provider in format 1, 2, or 3 of Annex B to create a CPRM-protected SD Card File.

The entity creating the CPRM-protected SD Card File SHALL create the content keys necessary to secure the file according to SD Association Part 15 SD-SD (Separate Delivery) Specification [SDA-15].

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A.3.2. Recording to the SD Card

CPRM-protected SD Cards have the capability to contain multiple video files and associated metadata files recorded at different times. Files can be supplied that are compatible with different CPRM-protected SD Cards such as SD-Video or SDSD-Video. The Discrete Media Client SHALL add the new file to the media without overwriting, deleting, or interfering with existing files.

Some SD Card files are generated or modified during recording to the SD Card. The Discrete Media Client SHALL perform the correct action according [SDA-GP] and [SD-SDSD].

The Retailer or DSP SHALL provide the Discrete Media Content keys according to [SDA-15] and any key revocations according to [4C-SDSD] to the Discrete Media Client.

The Discrete Media Client SHALL set Copy Count Control Information to “Copy is never permitted” (0000b) and Initial Move Control Information and Current Move Control Information to “Move is permitted unlimited times” (11b) & (11b) [4C-SDV].

The Discrete Media Client SHALL write the received CPRM-protected SD Card File, keys, and associated metadata onto the SD Card in accordance with [SDA-15] and [4C-SDV].

The Discrete Media Client SHALL create or modify associated CPRM usage rules such that existing usage rules and associations do not change, in accordance with [SDA-15].

The Discrete Media Client recording process SHALL NOT add, modify, or remove any material not considered part of the Discrete Media fulfillment, such as mp3 files, jpg files, or other customer files already existing on the SD Card.

The Discrete Media Client recording process SHALL NOT remove any files on the SD Card from a previous Discrete Media Fulfillment operation.

The Discrete Media Client SHALL allow any single SD Card to be used with multiple Discrete Media Fulfillment operations so long as there is sufficient space available on the SD Card.

The Discrete media Client SHALL support CPRM key revocation for SD Cards in accordance with [4C-SDSD].

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Annex B. Discrete Media Publishing Formats

Note: This annex may be updated from time to time as new Discrete Publishing Formats are approved and added.

One the following formats is required for a Content Provider to supply a Retailer or DSP for fulfillment of a Discrete Media Right. In the case of Packaged DVD, the Content Provider may deliver directly to the User.

1. DVD ISO image file

A complete DECE ISO Image file (as specified in section 5.1) or a “raw” DVD ISO image file, DDP file, or CMF file to be converted by the Retailer or DSP as needed to conform with an Approved Discrete Media Fulfillment Method.

2. Mezzanine file

A common intermediary file format chosen by the Content Provider. The Retailer or DSP may convert the file to conform with an Approved Discrete Media Fulfillment Method.

3. DECE Container File

An unencrypted DECE Container File in SD or HD profile or an encrypted DECE Common Container File with decryption keys. Retailer or DSP may decrypt and convert the file to conform with an Approved Discrete Media Fulfillment Method.

4. Packaged DVD

A pre-recorded DVD, typically in the format and packaging used for retail sale. Delivered in unmodified form to the User.

END