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Information technology — Multimedia application format (MPEG-A) —

Part 5:
Media streaming application format

Technologies de l'information — Format pour application multimédia (MPEG-A) —

Partie 5: Format pour application de transmission multimédia en continu

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Foreword

ISO (the International Organization for Standardization) and IEC (the International Electrotechnical Commission) form the specialized system for worldwide standardization. National bodies that are members of ISO or IEC participate in the development of International Standards through technical committees established by the respective organization to deal with particular fields of technical activity. ISO and IEC technical committees collaborate in fields of mutual interest. Other international organizations, governmental and non-governmental, in liaison with ISO and IEC, also take part in the work. In the field of information technology, ISO and IEC have established a joint technical committee, ISO/IEC JTC 1.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of the joint technical committee is to prepare International Standards. Draft International Standards adopted by the joint technical committee are circulated to national bodies for voting. Publication as an International Standard requires approval by at least 75 % of the national bodies casting a vote.

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

ISO/IEC 23000-5 was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 29, *Coding of audio, picture, multimedia and hypermedia information*.

This second edition cancels and replaces the first edition (ISO/IEC 23000-5:2008), which has been technically revised.

ISO/IEC 23000 consists of the following parts, under the general title *Information technology — Multimedia application format (MPEG-A)*:

— *Part 1: Purpose for multimedia application formats* [Technical Report]

— *Part 2: MPEG music player application format*

— *Part 3: MPEG photo player application format*

— *Part 4: Musical slide show application format*

— *Part 5: Media streaming application format*

— *Part 6: Professional archival application format*

— *Part 7: Open access application format*

— *Part 8: Portable video application format*

— *Part 9: Digital Multimedia Broadcasting application format*

— *Part 10: Video surveillance application format*

— *Part 11: Stereoscopic video application format*

— *Part 12: Interactive music application format*

Introduction

ISO/IEC 23000 adds to a sequence of International Standards that have been developed by JTC 1/SC 29. Parts of ISO/IEC 23000 are developed by selecting existing technologies from published JTC 1/SC 29/WG 11 International Standards and combining them into so-called "Multimedia Application Formats" or MAFs. In justified instances external standards or specifications may also be referenced.

ISO/IEC 23000 aims to serve clearly identified market needs by facilitating the swift development of innovative and standards-based multimedia applications and services. This application-driven process results in normative specifications of multimedia formats along with reference software implementation allowing interoperability at the application level.

This part of ISO/IEC 23000 is aimed at applications involving the distribution of governed media resources, metadata and related information streamed over a variety of delivery systems to Media Streaming Players, possibly members of a domain in which the content can be securely distributed once stored in a file. Typical examples of such applications are IPTV, Digital Broadcasting without a return channel and streaming of interactive video with embedded metadata and multimedia objects with presentation information.

Information technology — Multimedia application format (MPEG-A) —

Part 5:
Media streaming application format

1   Scope

This part of ISO/IEC 23000 specifies a digital item structure, a file format, and references a set of protocols used in a media streaming environment for applications where governed audio and video information is streamed to an end-user device by means of existing protocols such as MPEG-2 Transport Stream or Real Time Protocol over User Datagram Protocols over Internet Protocol (RTP/UDP/IP), and provides informative implementation examples corresponding to specific applications.

NOTE   This part of ISO/IEC 23000 offers a standardized solution for the streaming of audio-visual information, metadata, multimedia objects and related presentation information to facilitate simple and fully interoperable exchange across different devices and platforms. The Media Streaming Application Format allows conforming devices to access audio and video information that is governed or ungoverned, and reaches end-user devices using a variety of means.

The format of the media streaming content specified as part of this part of ISO/IEC 23000 relies on a number of MPEG technologies such as these found in ISO/IEC 21000-2, ISO/IEC 21000-3, ISO/IEC 21000-4, ISO/IEC 21000-5, ISO/IEC 21000-9 and ISO/IEC 21000-18, as well as on several MPEG-2/4 standards related to audio/video encoding and composition, as this MAF specifies "native" resources for some application scenarios. Some of the International Standards mentioned above are referenced in their entirety by this part of ISO/IEC 23000, whereas others are only used partially, and in a specific way.

2   Normative references

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

ISO/IEC 21000-2, *Information technology — Multimedia framework (MPEG-21) — Part 2: Digital Item Declaration*

ISO/IEC 21000-4, *Information technology — Multimedia framework (MPEG-21) — Part 4: Intellectual Property Management and Protection Components*

ISO/IEC 21000-9:2005, *Information technology — Multimedia framework (MPEG-21) — Part 9: File Format*

ISO/IEC 21000-16:2005, *Information technology — Multimedia framework (MPEG-21) — Part 16: Binary Format*

ISO/IEC 23001-1:2006, *Information technology — MPEG systems technologies — Part 1: Binary MPEG format for XML*

ISO/IEC 23001-3, *Information technology — MPEG systems technologies — Part 3: XML IPMP messages*

1

3 Terms and definitions

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

3.1
content provider device
CPD
device delivering content to another device

3.2
device
combination of hardware and software or just an instance of software that allows a user to perform actions

3.3
domain management device
DMD
device managing the lifecycle of a domain and the membership of devices and users part of it

3.4
IPMP Processor
module in a Media Streaming Player in charge of retrieving, instantiating, initializing and managing the IPMP Tools required to perform actions on content

3.5
IPMP Tool
module performing (one or more) IPMP functions such as authentication, decryption, watermarking, etc.

3.6
IPMP Tool Agent
module instantiating, initializing, authenticating, and supervising any operation performed between IPMP Tools within an IPMP Tool Group

3.7
IPMP Tool Body
executable code implementing either a Single IPMP Tool or an IPMP Tool Pack

3.8
IPMP Tool Group
combination of several IPMP Tools

3.9
IPMP Tool Pack
module that comprises an IPMP Tool Group and its IPMP Tool Agent

3.10
IPMP Tool Provider Device
device delivering IPMP Tools to another device

3.11
License Provider Device
LPD
device delivering licenses to another device

3.12
Media Streaming Device
any device used in Media Streaming environments including Media Streaming Player, Content Provider Device, License Provider Device, IPMP Tool Provider Device, and Domain Management Device

3.13
Media Streaming Player
MSP
device capable of consuming content for human use

3.14
User
any entity interacting in a media streaming environment using a media streaming device

4   Abbreviated terms

For the purposes of this document, the following abbreviated terms apply.

DID   Digital Item Declaration

DI   Digital Item

DIDL   Digital Item Declaration Language

DII   Digital Item Identification

IPMP   Intellectual Property Management and Protection

MSD   Media Streaming Device

MSAF   Media Streaming application format

PDI   Presentation of Digital Item

PPE   Protection of Presentation Element

URI   Uniform Resource Identifier

XML   Extensible Markup Language

5   Namespace conventions

Throughout this part of ISO/IEC 23000, qualified names are written with a namespace prefix followed by a colon followed by the local part of the qualified name.

For clarity, throughout this part of ISO/IEC 23000, consistent namespace prefixes are used. Table 1 gives these prefixes and the corresponding namespace.

Table 1 — Namespaces and prefixes

Prefix	Corresponding namespace
didl	urn:mpeg:mpeg21:2002:02-DIDL-NS
didmodel	urn:mpeg:mpeg21:2002:02-DIDMODEL-NS
didl-msx	urn:mpeg:maf:schema:mediastreaming:DIDLextensions
dii	urn:mpeg:mpeg21:2002:01-DII-NS
dsig	http://www.w3.org/2000/09/xmldsig#
ipmpdidl	urn:mpeg:mpeg21:2004:01-IPMPDIDL-NS

ipmpmsg	urn:mpeg:mpeg21:2006:07-IPMPMESSAGES-NS
ipmpinfo	urn:mpeg:mpeg21:2004:01-IPMPINFO-NS
m1x	urn:mpeg:mpeg21:2005:01-REL-M1X-NS
ms-tva	urn:mpeg:maf:Profile:mediastreaming:tva:2007
mxmacp	urn:mpeg:mpeg-m:schema:accesscontentprotocol:2009
mxmaitp	urn:mpeg:mpeg-m:schema:accessipmptoolprotocol:2009
mxmalp	urn:mpeg:mpeg-m:schema:accesslicenseprotocol:2009
mxmaucp	urn:mpeg:mpeg-m:schema:authenticatecontentprotocol:2009
mxmbp	urn:mpeg:mpeg-m:schema:baseprotocol:2009
mxmd	urn:mpeg:mpeg-m:schema:domain:2009
mxmdp	urn:mpeg:mpeg-m:schema:domainprotocol:2009
mxmicp	urn:mpeg:mpeg-m:schema:identifycontentprotocol:2009
mxmrlp	urn:mpeg:mpeg-m:schema:revokelicenseprotocol:2009
mxmscp	urn:mpeg:mpeg-m:schema:storecontentprotocol:2009
mxmslp	urn:mpeg:mpeg-m:schema:storelicenseprotocol:2009
r	urn:mpeg:mpeg21:2003:01-REL-R-NS
sx	urn:mpeg:mpeg21:2003:01-REL-SX-NS
tva	urn:tva:metadata:2002
xenc	http://www.w3.org/2001/04/xmlenc#
xsd	http://www.w3.org/2001/XMLSchema
xsi	http://www.w3.org/2001/XMLSchema-instance

6   System overview

Figure 1 depicts a general systems overview. As this part of ISO/IEC 23000 is not an end-to-end specification but only a "streaming format" and associated protocols leading to a Media Streaming Player specification, only the relationships with other devices that are directly functional to the performance of the Media Streaming Player are shown. For example, the Media Streaming Application Format does not provide the specification for a device registration protocol.
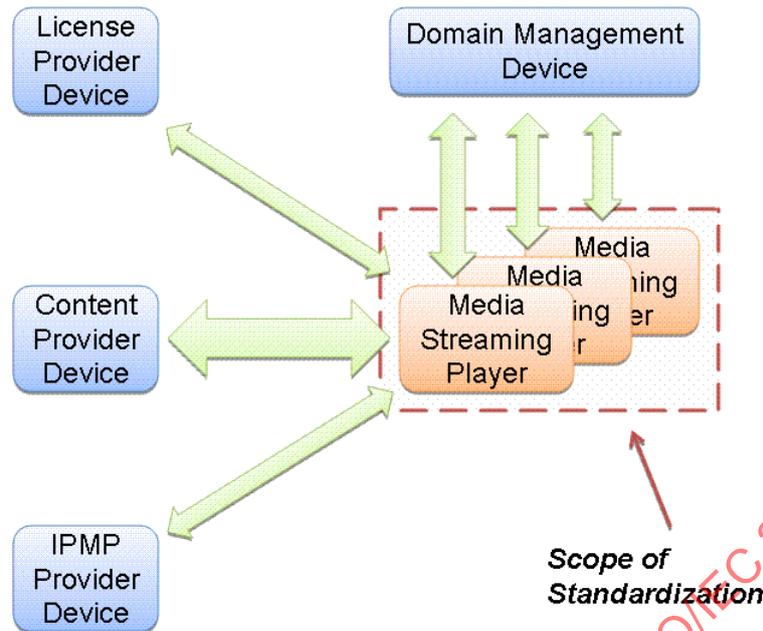
Figure 1 — Reference diagram for Media Streaming applications

In Figure 1, the data flowing through the dotted block are the subject to this part of ISO/IEC 23000.

Any device in the reference diagram is called a *Media Streaming Device* (MSD). An MSD can be any of the following devices:

a) *Media Streaming Player, i.e., a device capable of consuming content for human use.*

b) *Content Provider Device, i.e.,* a device capable of interacting with a *Media Streaming Player* to provide Media Streaming Content.

c) *License Provider Device, i.e.,* a device capable of interacting with a *Media Streaming Player* to provide Licenses.

d) *IPMP Tool Provider Device, i.e.,* a device capable of interacting with a *Media Streaming Player* to provide IPMP Tools.

e) *Domain Management Device, i.e.,* a device capable of managing various functions needed for a proper functioning of a domain, e.g.,
   1) create domain,
   2) renew domain,
   3) delete domain,
   4) add device to domain, or
   5) remove device from domain.

To exchange data with other devices a *Media Streaming Player employs* several types of Media Streaming Protocols specified in ISO/IEC 23006-4.

The following walkthrough explains the role of the technologies specified by this part of ISO/IEC 23000.

In the most general case a Media Streaming Player 1 obtains streaming content from a Content Provider Device using a Content Access Protocol. In order to use that content, a Media Streaming Player obtains a license from a License Provider Device using a License Access Protocol. Further, to actually process the content, a Media Streaming Player may need to obtain the appropriate IPMP Tools from an IPMP Tool Provider Device using an IPMP Tool Access Protocol.

This Media Streaming Player standard:

a) specifies how to use specific MPEG technologies

b) references the data formats exchanged between an MSD and a Media Streaming Player

c) references the transport protocols specified in ISO/IEC 23006-4 used to move data between an MSD and a Media Streaming Player

d) references the domain protocols used to exchange the data between an MSD and a Media Streaming Player specified in ISO/IEC 23006-4

The user may have a plurality of Media Streaming Players and may like to be able to use the content on all of them. In order to do that, he needs to have a domain created using a Domain Management Device and then obtain a domain-wide license. All interactions between Media Streaming Players and the Domain Management Device can be implemented by a set of protocols specified in ISO/IEC 23006-4.

Media Streaming Player 1 may create, depending on the license, a file that contains licenses, IPMP Tools, resources, etc. and possibly transfer the file to other Media Streaming Players for use in the domain.

7 Information representation

7.1 Introduction

In this part of ISO/IEC 23000, the information is represented by employing the XML technology. Depending on the type of information represented, this part of ISO/IEC 23000 references an existing standard in its entirety or references a suitable profile of an existing standard.

The following subclauses list and reference the representation of the different information types that are required for this part of ISO/IEC 23000.

7.2 Digital Item

This part of ISO/IEC 23000 utilises ISO/IEC 21000-2 to associate media content with a set of related information which a device requires in order to properly render it. Annex A specifies how to use the Digital Item Declaration to represent a Digital Item, including the Presentation of Digital Item, in the Media Streaming Application Format.

7.3 Metadata

The metadata used to describe the content is taken as a profile of the TV-Anytime metadata specification, published by ETSI and available as ETSI TS 102 822-3-1 V1.2.1.

The profile of TV-Anytime Metadata, whose URI is "urn:mpeg:maf:Profile:mediastreaming:tva:2007" is a limited set of elements defined in *TVAMainType* to include only the *Copyright*, *Classification* and *ProgramDescription* elements. The syntax of TVAMain element is specified in Figure 2, while for the semantics refer to ETSI TS 102 822-3-1 V1.2.1.

```
<element name="TVAMain" type="TVAMainType"/>
<complexType name="TVAMainType">
    <sequence>
        <element name="CopyrightNotice" type="string" minOccurs="0"/>
        <element name="ClassificationSchemeTable" type="ClassificationSchemeTableType"
minOccurs="0"/>
        <element name="ProgramDescription" type="ProgramDescriptionType" minOccurs="0"/>
    </sequence>
    <attribute ref="xml:lang" use="optional" default="en"/>
    <attribute name="publisher" type="string" use="optional"/>
    <attribute name="publicationTime" type="dateTime" use="optional"/>
    <attribute name="rightsOwner" type="string" use="optional"/>
    <attribute name="version" type="unsignedInt" use="optional"/>
</complexType>
```

Figure 2 —TVAMain element showing selected child elements

The *ProgramDescription* element defined in ETSI TS 102 822-3-1 V1.2.1 has been reduced to include only the *ProgramInformation*, *GroupInformationTable* and *CreditsInformationTable* elements. The *ProgramDescriptionType* complex type defined in this MAF is related to the TV-Anytime elements as follows;

```
<complexType name="ProgramDescriptionType">
<sequence>
    <element name="ProgramInformationTable" type="ProgramInformationTableType"
minOccurs="0"/>
    <element name="GroupInformationTable" type="GroupInformationTableType" minOccurs="0"/>
    <element name="CreditsInformationTable" type="CreditsInformationTableType"
minOccurs="0"/>
</sequence>
</complexType>
```

Figure 3 — The TVA ProgramDescription element showing selected child elements

NOTE   Since the elements omitted from the TV-Anytime Specification are all defined as optional, an instance document complying with this profile of the TV-Metadata will also be compliant with a TV-Anytime phase 1 implementations.

7.4   Digital Item Signature

In media streaming applications, the Digital Items representing content may need to be digitally signed. In this case, a digital signature can be attached to the DIDL by inserting it in a didl:DISignature child of a didl:DIDLInfo which in turn is child of the top-level didl:DIDL element in the Digital Item. Such a digital signature shall conform to the Digital Signature specification [21].

7.5   Identifiers

Every item of content can be composed by a number of other items of content or by resources, which all need to be uniquely identified. This part of ISO/IEC 23000 utilises ISO/IEC 21000-3 to achieve this purpose. Annex A specifies which elements part of ISO/IEC 21000-3 are used within a Digital Item Declaration.

7.6   Resources

This subclause covers video and audio resources which are native to this part of ISO/IEC 23000.

Table 2 — ISO/IEC 23000-5 native audio, video and multimedia resources

Video	
MPEG-2 Video Main Profile	ISO/IEC 13818-2:2000 Information technology – Generic coding of moving pictures and associated audio information: Video
MPEG-4 Visual Advanced Simple Profile	ISO/IEC 14496-2:2004 Information technology – Coding of audio-visual objects – Part 2: Visual
MPEG-4 Advanced Video Coding Main Profile	ISO/IEC 14496-10:2009 Information technology – Coding of audio-visual objects – Part 10: Advanced Video Coding
MPEG-4 Scalable Video Coding	Ditto
Audio	

MPEG-1 Audio Layer II	ISO/IEC 11172-3:1993 Information technology – Coding of moving pictures and associated audio for digital storage media at up to about 1,5 Mbit/s – Part 3: Audio
MPEG-4 Advanced Audio Coding	ISO/IEC 14496-3:2009 Information technology – Coding of audio-visual objects – Part 3: Audio
MPEG-4 High Efficiency-AAC	ISO/IEC 14496-3:2009 Information technology – Coding of audio-visual objects – Part 3: Audio
Multimedia	
LASeR	ISO/IEC 14496-20:2008 Information technology – Coding of audio-visual objects – Part 20: Lightweight Application Scene Representation (LASeR) and Simple Aggregation Format (SAF)

7.7 IPMP information

Digital Items and/or parts thereof such as media resources or metadata declarations may need for effective management and protection when distributed over heterogeneous access and delivery infrastructures. For this purpose, Annex D in this part of ISO/IEC 23000 specifies how to use ISO/IEC 21000-4 to protect Digital Items and parts thereof.

The Media Streaming MPEG-21 IPMP Components represents a flexible and extensible framework for applying protection mechanisms to a Digital Item. However, the protection mechanisms are based on the IPMP Tool model as defined in ISO/IEC 13818-11 and ISO/IEC 14496-14. The Application Programming Interface enabling interoperable operations of IPMP Tools on a device is provided by ISO/IEC 23001-3.

7.8 License

In this part of ISO/IEC 23000, licenses governing the use of content or parts thereof are expressed according to the Dissemination and Capture (ISO/IEC 21000-5:2004/Amd.2:2007) and Open Release Content (ISO/IEC 21000-5:2004/Amd.3:2008) profiles of ISO/IEC 21000-5.

7.9 Key

Media Streaming applications may require the use of encryption and decryption keys during their execution. There are two types of keys:

- time-independent keys, i.e., keys that do not need to be synchronised to the content delivery. These are represented as specified in [1].
- time-dependent keys, i.e., keys that are synchronised to timely packet delivery, for instance for the timely decoding of streamed content.

The decryption keys required to a Media Streaming Player are represented as specified in ISO/IEC 23001-3. How these are exchanged between MSDs or IPMP Tools is also part of ISO/IEC 23001-3.

7.10 IPMPX Messages

In order to allow a Device to host a number of non normative IPMP Tools, a Media Streaming Player shall employ the message-based interface defined in ISO/IEC 23001-3. .This part of ISO/IEC 23000 requires the use of IPMP Tools to enforce Intellectual Property Management and Protection on a Media Streaming Player. For this purpose, ISO/IEC 23001-3 defines a set of messages which are employed in a Media Streaming Player for three purposes:

a) to enable a Media Streaming Player to instantiate, initialise, authenticate and manage IPMP Tools throughout their lifecycle in an standard way

b) to enable IPMP Tools to exchange information between them or with the Media Streaming Player in an interoperable way

c) to enable an IPMP Tool to receive IPMP information from a Media Streaming Device through the Digital Item streamed to the Media Streaming Player on which the IPMP Tool is instantiated

ISO/IEC 23001-3 specifies how the IPMP-X messages are employed in a media streaming scenario to enable the three scenarios above.

7.11 Device information

Media Streaming Application Format employs a combination of IPMP-X Messages and IPMP Components to signal the technical characteristics of a device (e.g. type of operating system, memory, CPU, IPMP Tool instantiation and initialisation API) in order to allow each device to choose among a set of IPMP Tool Bodies identified by the same IPMP Tool identifier, the one(s) suitable for running on it.

7.12 Event Reporting

Media Streaming Application Format employs ISO/IEC 21000-15 Event Reporting.

7.13 Binary XML

To optimise the delivery of Digital Items, this part of ISO/IEC 23000 shall use ISO/IEC 21000-16 and ISO/IEC 23001-1.

8 Transport protocols

8.1 Introduction

Digital Items possibly including resources need to be transferred between devices as files or streams.

8.2 Streaming protocols

The Media Streaming Application Format adopts ISO/IEC 21000-18, Digital Item Streaming (DIS), for the streaming of Digital Items. DIS defines the Bitstream Binding Language (BBL) for providing instructions on how to fragment a Digital Item for delivery over a given transport protocol.

In the case of the DIDL document representing a Digital Item, fragments may include additional information provided by BBL to assist in re-constructing the DIDL document. This information is provided as BBL provided attributes of the transported fragments.

EXAMPLE 1: A bbl:context attribute provided on the root of a subtree of a fragment indicates the location it is to be attached in the re-constructed DIDL document.

EXAMPLE2: A bbl:fragmentRef attribute provided on the root of a subtree of a fragment matches the value of a bbl:fragmentID attribute sent previously to locate the point the subtree is to be attached in the re-constructed DIDL document.

8.3 File format

Digital Items, together with included or referenced resources that are received via streaming are stored according to the MPEG-21 file format. Annex F specifies the usage of MPEG-21 file format for media streaming applications.

9   Device to Device Protocols

9.1   Access Protocols

This part of ISO/IEC 23000 uses a set of protocols to access content, license, IPMP Tool Bodies and keys, both as file or as a stream of data. These protocols are specified in ISO/IEC 23006-4.

9.2   Domain Management Protocols

In case there is a need to license content to a plurality of Media Streaming Players or users, the domain management technology specified in ISO/IEC 23006-4 is used.

10   Reference software

The Reference Software of this part of ISO/IEC 23000 uses the MPEG eXtensible Middleware (MXM) Reference Software.

Therefore the Reference Software of the Media Streaming Application Format only provides the Applications that are specific of the Media Streaming Player and of the other Media Streaming Devices. The full Reference Software requires use of the MXM Reference Software.

11   Conformance testing

The purpose of this part of ISO/IEC 23000 conformance is to enable a user to test that an implementation of a Media Streaming Player conforms to this part of ISO/IEC 23000. Therefore the following (non-exhaustive list of) test suites are provided:

a)   Digital Items of the following types

   1)   with/without IPMP Information Descriptors/IPMP DIDL

   2)   with/without licenses

   3)   with/without IPMP Tools

b)   Licenses granting

   1)   a number of rights (e.g. mx:play, m1x:governedCopy) to a MSP under a number of conditions typical of the DAC profile

   2)   the right to play and distribute content within a domain

c)   IPMP Tools (examples of)

In order to allow MSD developers to test their implementation for conformance, the following example implementations of MSDs based on the reference software are provided:

a)   Media Streaming Player

b)   Content Provider Device

c)   License Provider Device

d)   IPMP Tool Provider Device

e)   Domain Management Device

Annex A
(normative)

Usage of DIDL in the Media Streaming Application Format

A.1 Media Streaming DIDL profile

A.1.1 Overview

The following subclauses specify the DIDL elements employed in the Media Streaming DIDL profile.

A.1.2 Media Streaming DIDL elements definition

A Media Streaming DIDL instance shall use the following elements from ISO/IEC 21000-2: `DIDL`, `Item`, `Descriptor`, `Statement`, `Component`, `Resource`, and `Presentation`. Compliant Media Streaming Players shall support the elements and complex types defined in this Annex as a minimum. However, a compliant Media Streaming Player may be able to interpret additional elements from ISO/IEC 21000-2 or from other specification, if still conformant to this part of ISO/IEC 23000.

A.1.2.1 Item

The Item element can appear either as the root element of a Media Streaming DIDL instance document, or as child of another Item. In the former case, it represents a particular instance of content, while in the latter it represent either another particular instance of content contained in another instance of content, or a media resource.

A.1.2.2 Descriptor

A Descriptor is a container of Statement elements only.

A.1.2.3 Statement

The DIDL Media Streaming instances restrict the number of child elements that a Statement may contain, as specified in A.1.3. The information contained in a Statement element is related to the content or the resource represented by the parent Item that contains such Statement in a Descriptor element.

In the particular case in which the Statement is a child element of a Descriptor whose parent element is a top-level Item (representing an instance of Content), then the Statement may contain the `ipmpinfo:IPMPGeneralInfoDescriptor`.

A.1.2.4 Component

A Component is a container of a Resource element.

A.1.2.5 Resource

A Resource element defines an individually identifiable Asset such as a video or audio clip, an image, an electronic ticket, or a textual Asset.

A.1.3 Profile definition

Element/Child Element	Restrictions
didl:DIDL	**The top level element in a Digital Item is always a didl:DIDL element, except in those cases where a Digital Item is nested within another Digital Item, in which case the top-level element of the nested component is a didl:Item element.**
didl:Item	**The Item element can appear either as the root element of a Media Streaming DIDL instance document, as a child of didl;DIDL element, or as child of another Item. In the first two cases, it represents a Digital Item, while in the latter represents either a Digital Item nested in the parent Digital Item, or a resource part of a Digital Item.**
didl:DIDLInfo	**A container for digital signatures for the digital item.**
didl:Item	**This element is restricted to include at least one didmodel:Descriptor element and one or more choices between didmodel:Item and didmodel:Component elements.**
didl:Descriptor	**This element associates information with the parent didl:Item.**
didl:Item	**As child of another didl:Item, a didl:Item represents either a Digital Item nested in the parent Digital Item, or a resource part of a Digital Item.**
didl:Component	**This element associates a didl:Resource to the didl:Item representing it.**
didl:DIDLInfo	**Restricted to contain the DISignature element only.**
didl:Descriptor	**This element is restricted to include a didmodel:Statement element only or a didlmodel:Component element only.** **NOTE A didl:Component element child of a didl:Descriptor can be used to contain any type media describing the item.**
didl:Statement	**A didl:Statement element contains information related to the nearest didl:Item containing it.**
didl:Component	**This element is restricted to include a didmodel:Resource element only.**
didl:Resource	**As defined in 7.2.11 in ISO/IEC 21000-2:2005.**
didl:Statement	**This element is restricted to include a choice between the following elements: dii:Identifier, didl-msx:Metadata, dii:RelatedIdentifier, ipmpinfo:IPMPGeneralInfoDescriptor, ContentElementSignature and Presentation. The Statement element child of the first Descriptor, which is child of an Item shall always contain a dii:Identifier.**
dii:Identifier	**As defined in ISO/IEC 21000-3.**

	didl-msx:Metadata	**As defined in A.2.1.**
	dii:RelatedIdentifier	**As defined in ISO/IEC 21000-3.**
	Ipmpinfo:IPMPGeneralInfoDescriptor	**As defined in D.1.5** **An IPMPGeneralInfoDescriptor element shall only appear once in a protected DIDL document, and only in a Statement included in a Descriptor child of a top-level Item.**
	didl:ContentElementSignature	**element of type dsig:SignatureType containing the hash value or Signature of the Content Element represented by the Item containing the Statement**
	didl:Presentation	**As defined in 7.2.21 of ISO/IEC 21000-2:2005/Amd.1**
didl:Choice		**As defined in 7.2.16 of ISO/IEC 21000-2:2005.**
didl:Resource		**As defined in 7.2.11 of ISO/IEC 21000-2:2005.**
didl:Selection		**As defined in 7.2.17 of ISO/IEC 21000-2:2005.**
didl:Condition		**As defined in 7.2.18 of ISO/IEC 21000-2:2005.**

Example: The figure below shows an example of two Media Streaming DIs nested in another DI. The text in bold font shows the Content ID of the top-level DI (urn:myContent:0003) containing the two other DIs identified by urn:myContent:0001 and urn:myContent:0002.

```
<didl:DIDL>
    <didl:Item id="A1">
        <didl:Descriptor>
            <didl:Statement mimeType="text/xml">
                <dii:Identifier>urn:myContent:0003</dii:Identifier>
            </didl:Statement>
        </didl:Descriptor>
        <didl:Item id="B1">
            <didl:Descriptor>
                <didl:Statement mimeType="text/xml">
                    <dii:Identifier>urn:myContent:0001</dii:Identifier>
                </didl:Statement>
            </didl:Descriptor>
            <didl:Item id="C1">
                <didl:Descriptor>
                    <didl:Statement mimeType="text/xml">
                        <dii:Identifier>urn:myResources:Audio:0001</dii:Identifier>
                    </didl:Statement>
                </didl:Descriptor>
            </didl:Item>
            <didl:Item id="C2">
                <didl:Descriptor>
                    <didl:Statement mimeType="text/xml">
                        <dii:Identifier>urn:myResources:Video:0001</dii:Identifier>
                    </didl:Statement>
                </didl:Descriptor>
            </didl:Item>
        </didl:Item>
        <didl:Item id="B2">
        <didl:Descriptor>
            <didl:Statement mimeType="text/xml">
                <dii:Identifier>urn:myContent:0002</dii:Identifier>
```

```
                </didl:Statement>
            </didl:Descriptor>
            <didl:Item id="C3">
                <didl:Descriptor>
                    <didl:Statement mimeType="text/xml">
                        <dii:Identifier>urn:myResources:Audio:0002</dii:Identifier>
                    </didl:Statement>
                </didl:Descriptor>
            </didl:Item>
            <didl:Item id="C4">
                <didl:Descriptor>
                    <didl:Statement mimeType="text/xml">
                        <dii:Identifier>urn:myResources:Video:0002</dii:Identifier>
                    </didl:Statement>
                </didl:Descriptor>
            </didl:Item>
        </didl:Item>
    </didl:Item>
</didl:DIDL>
```

Figure A.1 — The Media Streaming profile of the DIDL schema

A.2 Media Streaming Descriptors

Media Streaming DIDL Descriptors defined in A.1.3 may contain a didl-msx:Metadata element describing the nearest didl:Item containing it. The didl-msx:Metadata is described below.

A.2.1 Metadata

The Metadata element allows the inclusion of either encrypted metadata or metadata in clear format. Metadata contained in a Statement is related to the Asset represented by the Item parent of the Descriptor containing the above mentioned Statement In the first case, metadata is conveyed as specified in ISO/IEC 21000-4, while in the second case, metadata is conveyed in the StructuredData element. An identifier for the enclosed metadata can be conveyed by means of the optional attribute "id."

Table A.1 — METADATA element syntax

Diagram			
Used by	<Statement>		
Attributes	**Name**	**Type**	**Description**
	id	anyURI	The identifier for the metadata

Source	`<element name="Metadata" type="didl-msx:MetadataType"/>`
	`<complexType name="MetadataType">`
	`    <sequence>`
	`        <choice>`
	`            <group ref="ipmpdidl:IPMPDIDLChildGroup" minOccurs="0"/>`		

```
                    <element ref="didl-msx:StructuredData" maxOccurs="unbounded"/>
                </choice>
                <element ref="dsig:Signature" minOccurs="0"/>
            </sequence>
            <attribute name="id" type="anyURI" use="optional"/>
        </complexType>
```

A.2.2 StructuredData

The StructuredData element can contain metadata from any namespace. The "ref" attribute identifies the schema in use. If this attribute is omitted, the default value is "urn:mpeg:maf:Profile:mediastreaming:tva:2007" which is the namespace defined in 7.3.

Table A.2 — STRUCTUREDDATA element syntax

Diagram	
Used by	<Metadata>
Attributes	**Name**	**Type**	**Description**
	Ref	anyURI	The URI of the metadata schema namespace.

Source	`<element name="StructuredData" type="didl-msx:StructuredDataType"/>`
	`<complexType name="StructuredDataType">`
	`    <sequence>`
	`        <any namespace="##any" processContents="lax" minOccurs="0"/>`
	`    </sequence>`
	`    <attribute name="Ref" type="anyURI"`
	`default="urn:mpeg:maf:Profile:mediastreaming:tva:2007"/>`
	`</complexType>`

Example: The figure below shows an example of a Media Streaming Player digital item containing metadata conformant to "urn:mpeg:maf:Profile:mediastreaming:tva:2007":

```
<DIDL>
    <Item id="P1">
        <Descriptor>
            <Statement mimeType="text/plain">
                <dmp1_dii:Identifier>urn:myContent:0123</dmp1_dii:Identifier>
            </Statement>
        </Descriptor>
        <Descriptor>
            <Statement mimeType="text/xml">
                <didl-msx:Metadata>
                    <didl-msx:StructuredData ref="urn:dmp:idp2:tva:metadata:2002:2006:02">
                        <ms-tva:TVAMain>
                            <ms-tva:ProgramDescription>
                                <ms-tva:ProgramInformationTable>
                                    <tva:ProgramInformation
programId="crid://foo.com/1234567">
                                        <tva:BasicDescription>
                                            <tva:Title><![CDATA[Around the World in 80
Treasures]]></tva:Title>
                                            <tva:Synopsis length="short"><![CDATA[Dan
Cruickshank visits India and Sri Lanka as he continues his search for the world's most
beautiful and precious treasures. [S,SL]]]></tva:Synopsis>
```

```
                                              <tva:Genre
href="urn:tva:metadata:cs:ContentCS:2002:3.1.5.3">
                                                   <tva:Name><![CDATA[History]]></tva:Name>
                                              </tva:Genre>
                                              <tva:Genre
href="urn:tva:metadata:cs:IntentionCS:2002:1.3">
                                                   <tva:Name><![CDATA[EDUCATION]]></tva:Name>
                                              </tva:Genre>
                                              <tva:Genre
href="urn:tva:metadata:cs:ContentCS:2002:3.1.4">
                                                   <tva:Name><![CDATA[Arts & Media]]></tva:Name>
                                              </tva:Genre>
                                              <tva:CaptionLanguage closed="true">EN-
UK</tva:CaptionLanguage>
                                              <tva:SignLanguage translation="true"
type="BSL">EN-UK</tva:SignLanguage>
                                         </tva:BasicDescription>
                                         <tva:AVAttributes>
                                             <tva:AudioAttributes>
                                                 <tva:NumOfChannels>2</tva:NumOfChannels>
                                             </tva:AudioAttributes>
                                             <tva:VideoAttributes>
                                                 <tva:AspectRatio>16:9</tva:AspectRatio>
                                             </tva:VideoAttributes>
                                         </tva:AVAttributes>
                                     </tva:ProgramInformation>
                                 </ms-tva:ProgramInformationTable>
                             </ms-tva:ProgramDescription>
                         </ms-tva:TVAMain>
                     </didl-msx:StructuredData>
                 </didl-msx:Metadata>
           </Statement>
        </Descriptor>
    </Item>
</DIDL>
```

Figure A.2 — An example of DI containing metadata

Annex B
(informative)

The Media Streaming DIDL profile schemas

B.1 Media Streaming DIDL Profile schema

```xml
<?xml version="1.0"?>
<schema targetNamespace="urn:mpeg:mpeg21:2006:07-DIDL-NS"
        xmlns="http://www.w3.org/2001/XMLSchema"
        xmlns:didl="urn:mpeg:mpeg21:2006:07-DIDL-NS"
        xmlns:didl-msx="urn:mpeg:maf:schema:mediastreaming:DIDLextensions"
        xmlns:ipmpinfo="urn:mpeg:mpeg21:2004:01-IPMPINFO-NS"
        xmlns:ipmpdidl="urn:mpeg:mpeg21:2004:01-IPMPDIDL-NS"
        xmlns:didmodel="urn:mpeg:mpeg21:2002:02-DIDMODEL-NS"
        xmlns:dii="urn:mpeg:mpeg21:2002:01-DII-NS"
        xmlns:dsig="http://www.w3.org/2000/09/xmldsig#"
        elementFormDefault="qualified" attributeFormDefault="unqualified" version="0.1">
    <!--=======================================================-->
    <attributeGroup name="ID_ATTRS">
        <attribute name="id" type="ID" use="optional"/>
    </attributeGroup>
    <element name="DIDL" type="didl:DIDLType"/>
    <complexType name="DIDLType">
        <sequence>
            <element ref="didl:DIDLInfo" minOccurs="0" maxOccurs="unbounded"/>
            <element ref="didmodel:Item"/>
        </sequence>
        <anyAttribute namespace="##other" processContents="lax"/>
    </complexType>
    <element name="DIDLInfo" type="didl:DIDLInfoType"/>
    <complexType name="DIDLInfoType">
        <sequence>
            <element name="DISignature" type="dsig:SignatureType"/>
        </sequence>
    </complexType>
    <element name="Item" type="didl:ItemType" substitutionGroup="didmodel:Item"/>
    <complexType name="ItemType">
        <complexContent>
            <extension base="didmodel:ItemType">
                <sequence>
                    <element ref="didmodel:Descriptor" maxOccurs="unbounded"/>
                    <choice minOccurs="0" maxOccurs="unbounded">
                        <element ref="didmodel:Item"/>
                        <element ref="didmodel:Component"/>
                    </choice>
                </sequence>
                <attributeGroup ref="didl:ID_ATTRS"/>
            </extension>
        </complexContent>
    </complexType>
    <element name="Descriptor" type="didl:DescriptorType"
substitutionGroup="didmodel:Descriptor"/>
    <complexType name="DescriptorType">
        <complexContent>
            <extension base="didmodel:DescriptorType">
                <sequence>
                    <element ref="didmodel:Statement"/>
                </sequence>
            </extension>
        </complexContent>
```

```
        </complexType>
    <element name="Statement" type="didl:StatementType"
substitutionGroup="didmodel:Statement"/>
    <complexType name="StatementType" mixed="true">
        <complexContent mixed="true">
            <extension base="didmodel:StatementType">
                <sequence>
                    <choice>
                        <element ref="dii:Identifier"/>
                        <element ref="dii:RelatedIdentifier"/>
                        <element ref="didl-msx:Metadata"/>
                        <element ref="ipmpinfo:IPMPGeneralInfoDescriptor"/>
                        <element name="ContentElementSignature" type="dsig:SignatureType"/>
                    </choice>
                </sequence>
                <attribute name="mimeType" type="string"/>
                <attribute name="ref" type="anyURI"/>
            </extension>
        </complexContent>
    </complexType>
    <element name="Component" type="didl:ComponentType"
substitutionGroup="didmodel:Component"/>
    <complexType name="ComponentType">
        <complexContent>
            <extension base="didmodel:ComponentType">
                <sequence>
                    <element ref="didmodel:Resource" maxOccurs="unbounded"/>
                </sequence>
            </extension>
        </complexContent>
    </complexType>
    <element name="Resource" type="didl:ResourceType"
substitutionGroup="didmodel:Resource"/>
    <complexType name="ResourceType" mixed="true">
        <complexContent mixed="true">
            <extension base="didmodel:ResourceType">
                <sequence>
                    <any namespace="##any" processContents="lax" minOccurs="0"/>
                </sequence>
                <attribute name="mimeType" type="string" use="required"/>
                <attribute name="ref" type="anyURI"/>
                <attribute name="encoding" type="string"/>
                <attribute name="contentEncoding" type="NMTOKENS"/>
            </extension>
        </complexContent>
    </complexType>
    <element name="Choice" type="didl:ChoiceType" substitutionGroup="didmodel:Choice"/>
    <complexType name="ChoiceType">
        <complexContent>
            <extension base="didmodel:ChoiceType">
                <sequence>
                    <element ref="didmodel:Condition" minOccurs="0" maxOccurs="unbounded"/>
                    <element ref="didmodel:Descriptor" minOccurs="0"
maxOccurs="unbounded"/>
                    <element ref="didmodel:Selection" maxOccurs="unbounded"/>
                </sequence>
                <attribute name="minSelections" type="nonNegativeInteger"/>
                <attribute name="maxSelections" type="positiveInteger"/>
                <attribute name="default" type="IDREFS"/>
                <attribute name="choice_id" type="ID"/>
                <anyAttribute namespace="##other" processContents="lax"/>
            </extension>
        </complexContent>
    </complexType>
    <element name="Selection" type="didl:SelectionType"
substitutionGroup="didmodel:Selection"/>
    <complexType name="SelectionType">
        <complexContent>
```

```
            <extension base="didmodel:SelectionType">
                <sequence>
                    <element ref="didmodel:Condition" minOccurs="0" maxOccurs="unbounded"/>
                    <element ref="didmodel:Descriptor" minOccurs="0"
maxOccurs="unbounded"/>
                </sequence>
                <attribute name="select_id" type="ID" use="required"/>
                <anyAttribute namespace="##other" processContents="lax"/>
            </extension>
        </complexContent>
    </complexType>
    <element name="Condition" type="didl:ConditionType"
substitutionGroup="didmodel:Condition"/>
    <complexType name="ConditionType">
        <complexContent>
            <extension base="didmodel:ConditionType">
                <attribute name="require" type="IDREFS"/>
                <attribute name="except" type="IDREFS"/>
            </extension>
        </complexContent>
    </complexType>
    <element name="Presentation" type="didl:PresentationType"
substitutionGroup="didmodel:Presentation"/>
    <complexType name="PresentationType">
        <complexContent>
            <extension base="didmodel:PresentationType">
                <sequence>
                    <any namespace="##any" processContents="lax" minOccurs="0"
maxOccurs="unbounded"/>
                </sequence>
                <attribute name="mimeType" type="string" use="required"/>
                <attribute name="precedence" type="string"/>
                <attribute name="ref" type="anyURI"/>
            </extension>
        </complexContent>
    </complexType>
</schema>
```

Figure B.1 — The Media Streaming profile of the DIDL schema

B.2 Media Streaming DIDL Extensions schema

```xml
<?xml version="1.0"?>
<schema targetNamespace="urn:mpeg:maf:schema:mediastreaming:DIDLextensions"
        xmlns="http://www.w3.org/2001/XMLSchema"
        xmlns:didl-msx="urn:mpeg:maf:schema:mediastreaming:DIDLextensions"
        xmlns:ipmpdidl="urn:mpeg:mpeg21:2004:01-IPMPDIDL-NS"
        xmlns:dsig="http://www.w3.org/2000/09/xmldsig#"
        elementFormDefault="qualified" attributeFormDefault="unqualified" version="0.1">
    <element name="Metadata" type="didl-msx:MetadataType"/>
    <complexType name="MetadataType">
        <sequence>
            <choice>
                <group ref="ipmpdidl:IPMPDIDLChildGroup" minOccurs="0"/>
                <element ref="didl-msx:StructuredData" maxOccurs="unbounded"/>
            </choice>
            <element ref="dsig:Signature" minOccurs="0"/>
        </sequence>
        <attribute name="id" type="anyURI" use="optional"/>
    </complexType>
    <element name="StructuredData" type="didl-msx:StructuredDataType"/>
    <complexType name="StructuredDataType">
        <sequence>
            <any namespace="##any" processContents="lax" minOccurs="0"/>
        </sequence>
        <attribute name="ref" type="anyURI" default="urn:mpeg:ms-maf:tva:2006:07"/>
    </complexType>
</schema>
```

Figure B.2 — Figure 2. The Media Streaming extensions of the DIDL schema

Annex C
(informative)

The Media Streaming TV Anytime Profile schema

C.1 The Media Streaming TV Anytime Profile schema

```xml
<?xml version="1.0" encoding="UTF-8"?>
<schema targetNamespace="urn:mpeg:maf:Profile:mediastreaming:tva:2007"
        xmlns:tva="urn:tva:metadata:2002"
        xmlns:tva-msaf="urn:mpeg:maf:Profile:mediastreaming:tva:2007"
        xmlns:mpeg7="urn:mpeg:mpeg7:schema:2001"
        xmlns="http://www.w3.org/2001/XMLSchema"
        elementFormDefault="qualified" attributeFormDefault="unqualified">
    <element name="TVAMain" type="tva-msaf:TVAMainType"/>
    <complexType name="TVAMainType">
        <sequence>
            <element name="CopyrightNotice" type="string" minOccurs="0"/>
            <element name="ClassificationSchemeTable"
type="tva:ClassificationSchemeTableType" minOccurs="0"/>
            <element name="ProgramDescription" type="tva-msaf:ProgramDescriptionType"
minOccurs="0"/>
        </sequence>
        <attribute ref="xml:lang" use="optional" default="en"/>
        <attribute name="publisher" type="string" use="optional"/>
        <attribute name="publicationTime" type="dateTime" use="optional"/>
        <attribute name="rightsOwner" type="string" use="optional"/>
        <attribute name="version" type="unsignedInt" use="optional"/>
    </complexType>
    <complexType name="ProgramDescriptionType">
        <sequence>
            <element name="ProgramInformationTable" type="tva:ProgramInformationTableType"
minOccurs="0"/>
            <element name="GroupInformationTable" type="tva:GroupInformationTableType"
minOccurs="0"/>
            <element name="CreditsInformationTable" type="tva:CreditsInformationTableType"
minOccurs="0"/>
        </sequence>
    </complexType>
</schema>
```

Figure C.1 — The Media Streaming profile of TV Anytime schema

Annex D
(normative)

Usage of IPMP Components in the Media Streaming Application Format

D.1 Media Streaming IPMP Components profile

D.1.1 Overview

The following subclauses specify the IPMP Components elements employed in the Media Streaming IPMP Components profile.

D.1.2 Media Streaming IPMP DIDL elements definition

A Media Streaming IPMP DIDL instance shall use the following elements from ISO/IEC 21000-4:, `Item`, `Statement`, `Resource`, `Contents`, `Info`, `Identifier`, `ProtectedAsset` and `Presentation`. Compliant Media Streaming Players shall support the elements and complex types defined in D.1 as a minimum. However, a compliant Media Streaming Player may be able to interpret additional elements from ISO/IEC 21000-4 or from other specification, if still conformant to this part of ISO/IEC 23000.

D.1.3 Media Streaming IPMP Information Descriptor elements definition

IPMP Information Descriptors in Media Streaming Extensions are conformant to IPMP Information Descriptors in ISO/IEC 21000-4. IPMP Information Descriptors in Media Streaming Player are composed of the subset of IPMP Information Descriptor schema with/without restrictions and extensions.

Element/Child Element	Restrictions
ipmpinfo:IPMPInfoDescriptor	**As defined in 7.3 of ISO/IEC 21000-4:2006.**
ipmpinfo:Tool	**As defined in 7.4 of ISO/IEC 21000-4:2006.**
ipmpinfo:RightsDescriptor	**As defined in 7.5 of ISO/IEC 21000-4:2006.**
dsig:Signature	**As defined in 7.6 of ISO/IEC 21000-4:2006.**
ipmpinfo:Tool	**As defined in 7.4 of ISO/IEC 21000-4:2006.**
ipmpinfo:ToolBaseDescription	**As defined in 7.4.4 of ISO/IEC 21000-4:2006.**
ipmpinfo:ToolRef	**As defined in 7.4.5 of ISO/IEC 21000-4:2006.**
ipmpinfo:InitializationSettings	**This element is restricted to include an `ipmpinfo:InitializationData` element only**
ipmpinfo:RightsDescriptor	**This element is restricted to include a choice between `ipmpinfo:License` and `ipmpinfo:LicenseReference` elements only.**
dsig:Signature	**As defined in 7.4.8 of ISO/IEC 21000-4:2006.**

ipmpinfo:InitializationData	This element is restricted to contain the following elements: `ipmpmsg:ControlPointID`, `ipmpmsg:ControlPointAddress` elements and any element extending the `ipmpmsg:Data_BaseClass` complex type only.
ipmpmsg:ControlPointID	As defined in 5.2.6.1 of ISO/IEC 21000-4:2006.
ipmpmsg:ControlPointAddress	As defined in 5.2.6.1 of ISO/IEC 21000-4:2006.
ipmpmsg:Data_BaseClass	As defined in 5.1.2 of ISO/IEC 21000-4:2006.
ipmpinfo:ToolBaseDescription	
ipmpinfo:IPMPToolID	As defined in 7.4.4.4 of ISO/IEC 21000-4:2006.
ipmpinfo:Inline	As defined in 7.4.4.5 of ISO/IEC 21000-4:2006.
ipmpinfo:Remote	As defined in 7.4.4.6 of ISO/IEC 21000-4:2006.
ipmpinfo:ConfigurationSettings	As defined in 7.4.4.6 of ISO/IEC 21000-4:2006.
dsig:Signature	As defined in 7.4.4.8 of ISO/IEC 21000-4:2006.
ipmpinfo:ConfigurationSettings	
ipmpinfo:Configuration	This element is restricted to contain the ipmpinfo_msx:ToolBody element only, described in D.1.4.
Ipmpinfo:Update	As defined in 7.4.4.7.4 of ISO/IEC 21000-4:2006.

D.1.4 Media Streaming IPMP Information Descriptor extension elements definition

IPMP Information Descriptors in Media Streaming Extensions are extended by the ipmpinfo_msx:ToolBody element. In the MS MAF, an IPMP Tool can be either a single Tool or a combination of IPMP Tools. In the latter case, the structure of the combinations and how they are described is specified in the subclause below:

D.1.4.1 ToolBody

The ToolBody element specifies information associated with IPMP Tool embodiments. When a Tool or Tool groups are signaled, Tool embodiment shall be instantiated on a device to enable access to the governed context. IPMP Tools are software or hardware modules performing one or more IPMP functions such as authentication, decryption, watermarking, etc. They may operate as "stand alone" Tools or they can be aggregated in a single entity or in a Tool Group.

A ToolBody element contains a SingleTool element which indicates stand-alone typed tool embodiment or a ToolPack element describing a tool group and its agent module, and an optional Signature.

Diagram	
Children	`<SingleTool><ToolPack><Signature>`
Used by	`<inline>`

Source	`<element name="ToolBody" type="ipmpinfo-msx:ToolBodyType"/>`
	`<complexType name="ToolBodyType">`
	    `<sequence>`
	        `<choice maxOccurs="unbounded">`
	            `<element ref="ipmpinfo-msx:SingleTool" />`
	            `<element ref="ipmpinfo-msx:ToolPack" />`
	        `</choice>`
	        `<element ref="dsig:Signature" minOccurs="0"/>`
	    `</sequence>`
	`</complexType>`

D.1.4.1.1   Example

The figure below is an example of Tool Body.

```
<ipmpinfo-msx:ToolBody>
    <ipmpinfo-msx:ToolPack>
        <ipmpinfo-msx:ToolBodyID>urn:Origin:ToolBodyID:01</ipmpinfo-msx:ToolBodyID>
        <ipmpinfo-msx:DeviceInformation>
            <mpeg4ipmp:OperatingSystem>
                <mpeg4ipmp:Vendor>Red Hat</mpeg4ipmp:Vendor>
                <mpeg4ipmp:Model>Enterprise</mpeg4ipmp:Model>
                <mpeg4ipmp:Version>9.0</mpeg4ipmp:Version>
            </mpeg4ipmp:OperatingSystem>
        </ipmpinfo-msx:DeviceInformation>
        <ipmpinfo-msx:ToolAgent>
            <ipmpinfo-msx:ToolAgentID>urn:Origin:ToolPack:ToolID:ABC9:ToolAgentID:01
            </ipmpinfo-msx:ToolAgentID>
            <!-- Include the code implementing the IPMP Tool in the element below -->
            <ipmpinfo-msx:ToolAgentBody>AB67543EF5554CD0</ipmpinfo-msx:ToolAgentBody>
        </ipmpinfo-msx:ToolAgent>
        <ipmpinfo-msx:ToolPackageType>application/zip</ipmpinfo-msx:ToolPackageType>
    </ipmpinfo-msx:ToolPack>
</ipmpinfo-msx:ToolBody>
```

D.1.4.2   \<SingleTool>

The `SingleTool` element specifies a Single IPMP Tool structure with tool code information concerning the environment on which it may operate. In addition to the binary IPMP Tool code, this element allows to convey further information, such as information on the device characteristics on which the tool may run, or the type of package containing the tool. The `ToolBodyID` defines identification for the `ToolBody` and the `DeviceInformation` element describes information about Tool's implementation or Tool's utilization such as API configurations. The `ToolPackageType` element describes the type of the embodied binary `ToolCode` element.

Diagram	ipmpinfo-msx:SingleToolType
	
	SingleTool ⊟ ─(•••)─ ⊟
	   ipmpinfo-msx:ToolBodyID
	   ipmpinfo-msx:DeviceInformation ⊞
	   ipmpinfo-msx:ToolPackageType
	   ipmpinfo-msx:ToolCode
	   dsig:Signature ⊞

Children	`<ToolBodyID><DeviceInformation><ToolPackageType><ToolCode><Signature>`
Used by	`<ToolBody>`

Source	`<element name="SingleTool" type="ipmpinfo-msx:SingleToolType"/>`
	`<complexType name="SingleToolType">`
	 `<sequence>`
	  `<element ref="ipmpinfo-msx:ToolBodyID"/>`
	  `<element ref=" ipmpinfo-msx:DeviceInformation" minOccurs="0"/>`
	  `<element name="ToolPackageType" type="string" minOccurs="0"/>`
	  `<element name="ToolCode" type="base64Binary"/>`
	  `<element ref="dsig:Signature" minOccurs="0"/>`
	 `</sequence>`
	`</complexType>`

D.1.4.3 <ToolBodyID>

The `ToolBodyID` conveys the ToolBody identifier.

Diagram	ToolBodyID
Used by	`<singleTool><ToolPack>`
Source	`<element name="ToolBodyID" type="anyURI"/>`
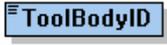
D.1.4.4 <DeviceInformation>

The `DeviceInformation` element specifies information about the environment on which the Tool may operate, and the API for instantiating and managing it.

Diagram	
Children	`<ToolAPI_Config><Others>`
Used by	`<singleTool><ToolPack>`

Source	`<element name="DeviceInformation" type="ipmpinfo-msx:DeviceType"/>`
	`<complexType name="DeviceType">`
	`    <complexContent>`
	`        <extension base="mpeg4ipmp:TerminalIDType">`
	`            <sequence>`
	`                <element ref="ipmpinfo-msx :ToolAPI_Config" minOccurs="0"`
	` maxOccurs="unbounded"/>`
	`                    <element ref="ipmpinfo-msx:Others" minOccurs="0"/>`
	`            </sequence>`
	`        </extension>`
	`    </complexContent>`
	`</complexType>`

D.1.4.5 <ToolAPI_Config>

The `ToolAPI_Config` element indicates the API supported by the IPMP Tool in order to instantiate it and exchange information with it. The `Instantiation_API_ID` and the `Messaging_API_ID` element specify the identifier of the APIs (of type anyURI) supported by the IPMP Tool for its instantiation and message exchange. These identifiers are registered and maintained by a Registration agency provided by ISO/IEC 14496-14. The `OpaqueData` element may be employed to convey proprietary configuration information to a tool.

Diagram	![Diagram showing ipmpinfo-msx:ToolAPI_ConfigType with ToolAPI_Config containing ipmpinfo-msx:Instantiation_API_ID, ipmpinfo-msx:Messaging_API_ID, ipmpinfo-msx:OpaqueData]
Children	`<Instantiation_API_ID><Messaging_API_ID><OpaqueData>`
Used by	`<DeviceInformation>`

Source	`<element name="ToolAPI_Config" type="ipmpinfo-msx:ToolAPI_ConfigType"/>`
	`<complexType name="ToolAPI_ConfigType">`
	    `<sequence>`
	        `<element name="Instantiation_API_ID" type="anyURI" minOccurs="0"/>`
	        `<element name="Messaging_API_ID" type="anyURI" minOccurs="0"/>`
	        `<element name="OpaqueData" type="hexBinary" minOccurs="0"/>`
	    `</sequence>`
	`</complexType>`

D.1.4.6 <Others>

The `Others` element describes other information of device for tool or tool API execution.

Diagram	![Diagram showing ipmpinfo-msx:OtherTypes with Others containing any ##any]		
Used by	`<DeviceInformation>`		
Attributes	**Name**	**Type**	**Description**
	ref	anyURI	The ref attribute shall be employed to indicate the URI of any schema extending the `Others` element, if present.

Source	`<element name="Others" type="ipmpinfo-msx:OtherTypes"/>`
	`<complexType name="OtherTypes">`
	    `<sequence>`
	        `<any namespace="##any" processContents="lax"/>`
	    `</sequence>`
	    `<attribute name="ref" type="anyURI" use="required"/>`
	`</complexType>`		

D.1.4.7 <ToolPack>

A logical IPMP Tool can be composed of several modules. The `ToolPack` element describes a structured group of IPMP Tools and the environment in which they operate. An IPMP Tool Pack is a special case of an IPMP Tool because it consists of a group of IPMP Tools, named the IPMP Tool Group, plus a special component named the IPMP Tool Agent. The IPMP Tool Agent manages the Tool Group, performing functions such as instantiation, initialisation, etc. The device information element in a Tool Pack indicates the hardware and software environment in which the Tool Pack may operate.

Diagram	
Children	`<ToolBodyID><DeviceInformation><ToolPackageType><ToolAgent><ToolGroup>` `<Signature>`
Used by	`<ToolBody>`

Source	`<element name="ToolPack" type="ipmpinfo-msx:ToolPackType"/>`
	`<complexType name="ToolPackType">`
	    `<sequence>`
	        `<element ref="ipmpinfo-msx:ToolBodyID"/>`
	        `<element ref="ipmpinfo-msx:DeviceInformation" minOccurs="0"/>`
	        `<element name="ToolPackageType" type="string" minOccurs="0"/>`
	        `<element name="ToolAgent" type="ipmpinfo-msx:ToolAgentType"/>`
	        `<element name="ToolGroup" type="ipmpinfo-msx:ToolGroupType" minOccurs="0"/>`
	        `<element ref="dsig:Signature" minOccurs="0"/>`
	    `</sequence>`
	`</complexType>`

D.1.4.8   <ToolAgent>

The `ToolAgent` element conveys information about the IPMP Tool Agent logical component part of a Tool Group. The role of the IPMP Tool Agent is to instantiate, initialize, authenticate and supervise any operation performed by the IPMP Tools in the Tool Group.

Diagram	
Children	`<ToolAgentID><ToolAgentBody><Signature>`
Used by	`<ToolPack>`

Source	`<element name="ToolAgent" type="ipmpinfo-msx:ToolAgentType"/>`
	`<complexType name="ToolAgentType">`
	    `<sequence>`
	        `<element name="ToolAgentID" type="anyURI"/>`
	        `<element name="ToolAgentCode" type="base64Binary"/>`
	        `<element ref="dsig:Signature" minOccurs="0"/>`
	    `</sequence>`
	`</complexType>`

D.1.4.9   <ToolGroup>

The `ToolGroup` element conveys structured information related to an IPMP Tool Group. An IPMP Tool Group is a group of several IPMP Tools that can be instantiated and managed by the Tool Agent. In that case, the `ToolGroup` element can contain the binary code of all the IPMP Tools in the Tool Group.

Diagram	
Children	`<ToolGroupID><ToolGroupBody><Signature>`
Used by	`<ToolPack>`

Source	`<element name="ToolGroup" type="ipmpinfo-msx:ToolGroupType"/>`
	`<complexType name="ToolGroupType">`
	    `<sequence>`
	        `<element name="ToolGroupID" type="anyURI"/>`
	        `<element name="ToolGroupCode" type="base64Binary"/>`
	        `<element ref="dsig:Signature" minOccurs="0"/>`
	    `</sequence>`
	`</complexType>`

D.1.5   Media Streaming IPMP General Information Descriptor elements definition

All elements in the IPMP General Information Descriptor may be used by applications conformant to this specification. IPMP General Information Descriptors in the Media Streaming Player are composed of the subset of IPMP Information Descriptor schema with or without restrictions and/or extensions as specified in the following table.

Element/Child Element	Restrictions
ipmpinfo:IPMPGeneralInfoDescriptor	**As defined in 8.3 of ISO/IEC 21000-4:2006.**
ipmpinfo:ToolList	**This element is restricted to include only `ipmpinfo:ToolDescription`.**
ipmpinfo:LicenseCollection	**As defined in 8.5 of ISO/IEC 21000-4:2006.**

dsig:Signature	As defined in 8.6 of ISO/IEC 21000-4:2006.
ipmpinfo:ToolList	Restricted not to include the `dsig:Signature` element.
ipmpinfo:ToolDescription	Restricted not to include the `ipmpInfo:ConfigurationSettings` element.
ipmpinfo:ToolDescription	This element is restricted to include the following child elements only a `ipmpinfo:IPMPToolID`, an optional `ipmpinfo:MemberOf`, an optional `ipmpinfo:Inline` or `ipmpinfo:Remote`, an optional `ipmpinfo:RightsDescriptor` and an optional `dsig:Signature`.
ipmpinfo:IPMPToolID	As defined in 8.4.4.3 of ISO/IEC 21000-4:2006.
ipmpinfo:MemberOf	As defined in 8.4.4.4 of ISO/IEC 21000-4:2006.
ipmpinfo:Inline	As defined in 8.4.4.5 of ISO/IEC 21000-4:2006.
ipmpinfo:Remote	As defined in 8.4.4.6 of ISO/IEC 21000-4:2006.
ipmpinfo:RightsDescriptor	As defined in 8.4.4.8 of ISO/IEC 21000-4:2006.
dsig:Signature	As defined in 8.4.4.9 of ISO/IEC 21000-4:2006.
@localID	As defined in 8.4.4.1 of ISO/IEC 21000-4:2006.

Annex E
(informative)

Media Streaming IPMP Components schemas

E.1 IPMP Information Descriptor Media Streaming profile schema

```xml
<?xml version="1.0"?>
<schema targetNamespace="urn:mpeg:mpeg21:2004:01-IPMPINFO-NS"
      xmlns="http://www.w3.org/2001/XMLSchema"
      xmlns:ipmpinfo="urn:mpeg:mpeg21:2004:01-IPMPINFO-NS"
      xmlns:dsig="http://www.w3.org/2000/09/xmldsig#"
      xmlns:r="urn:mpeg:mpeg21:2003:01-REL-R-NS"
      xmlns:ipmpmsg="urn:mpeg:mpegB:schema:IPMP-XML-MESSAGES:2007"
      xmlns:mpeg4ipmp="urn:mpeg:mpeg4:IPMPSchema:2002"
      xmlns:ipmpinfo-
msx="urn:mpeg:maf:Schema:mediastreaming:IPMPINFOextensions:2007"
      elementFormDefault="qualified" attributeFormDefault="unqualified"
version="0.01">
    <!-- elements-->
    <element name="IPMPInfoDescriptor" type="ipmpinfo:IPMPInfoDescriptorType"/>
    <complexType name="IPMPInfoDescriptorType">
        <sequence>
            <element ref="ipmpinfo:Tool" minOccurs="0" maxOccurs="unbounded"/>
            <element ref="ipmpinfo:RightsDescriptor" minOccurs="0"
maxOccurs="unbounded"/>
            <element ref="dsig:Signature" minOccurs="0"/>
        </sequence>
    </complexType>
    <element name="Tool" type="ipmpinfo:ToolType"/>
    <complexType name="ToolType">
        <sequence>
            <choice>
                <element ref="ipmpinfo:ToolBaseDescription"/>
                <element ref="ipmpinfo:ToolRef"/>
            </choice>
            <element ref="ipmpinfo:InitializationSettings" minOccurs="0"/>
            <element ref="ipmpinfo:RightsDescriptor" minOccurs="0"/>
            <element ref="dsig:Signature" minOccurs="0"/>
        </sequence>
        <attribute name="order" type="positiveInteger"/>
    </complexType>
    <element name="ToolBaseDescription" type="ipmpinfo:ToolBaseDescriptionType"/>
    <complexType name="ToolBaseDescriptionType">
        <sequence>
            <element ref="ipmpinfo:IPMPToolID"/>
            <choice minOccurs="0">
                <element ref="ipmpinfo:Inline"/>
                <element ref="ipmpinfo:Remote"/>
            </choice>
            <element ref="ipmpinfo:ConfigurationSettings" minOccurs="0"/>
            <element ref="dsig:Signature" minOccurs="0"/>
        </sequence>
    </complexType>
    <element name="ToolRef" type="ipmpinfo:ToolRef"/>
```

```
<complexType name="ToolRef">
    <attribute name="localidref" type="IDREF" use="required"/>
</complexType>
<element name="IPMPToolID" type="anyURI"/>
<element name="Inline" type="ipmpinfo:InlineType"/>
<complexType name="InlineType">
    <sequence>
        <element ref="ipmpinfo:Binary"/>
        <element ref="dsig:Signature" minOccurs="0"/>
    </sequence>
</complexType>
<element name="Binary" type="base64Binary"/>
<element name="Remote" type="ipmpinfo:RemoteType"/>
<complexType name="RemoteType">
    <sequence>
        <element ref="dsig:Signature" minOccurs="0"/>
    </sequence>
    <attribute name="ref" type="anyURI"/>
</complexType>
<element name="ConfigurationSettings"
type="ipmpinfo:ConfigurationSettingsType"/>
    <complexType name="ConfigurationSettingsType" mixed="true">
        <sequence>
            <element ref="ipmpinfo:Configuration"/>
            <element ref="ipmpinfo:Update" minOccurs="0"/>
        </sequence>
    </complexType>
    <element name="Configuration" type="ipmpinfo:ConfigurationType"/>
    <complexType name="ConfigurationType" mixed="true">
        <sequence>
            <element ref="ipmpinfo-msx:ToolBody"/>
        </sequence>
    </complexType>
    <element name="Update" type="ipmpinfo:UpdateType"/>
    <complexType name="UpdateType">
        <sequence>
            <element ref="ipmpinfo:Location" maxOccurs="unbounded"/>
            <element ref="ipmpinfo:ScheduledUpdateTime" minOccurs="0"/>
            <element ref="ipmpinfo:SupportedPlatform" minOccurs="0"
maxOccurs="unbounded"/>
            <element ref="dsig:Signature" minOccurs="0"/>
        </sequence>
    </complexType>
    <element name="Location" type="ipmpinfo:RemoteType"/>
    <element name="Condition" type="ipmpinfo:ConditionType"/>
    <complexType name="ConditionType">
        <sequence>
            <element ref="ipmpinfo:ScheduledUpdateTime" minOccurs="0"/>
            <element ref="ipmpinfo:SupportedPlatform" minOccurs="0"
maxOccurs="unbounded"/>
        </sequence>
    </complexType>
    <element name="ScheduledUpdateTime" type="ipmpinfo:ScheduledUpdateTimeType"/>
    <complexType name="ScheduledUpdateTimeType">
        <simpleContent>
            <extension base="dateTime">
                <attribute name="periodic" type="duration" use="optional"/>
            </extension>
        </simpleContent>
    </complexType>
    <element name="SupportedPlatform" type="ipmpinfo:SupportedPlatformType"/>
```

```
    <complexType name="SupportedPlatformType">
        <sequence>
            <element ref="ipmpinfo-msx:DeviceInformation"/>
        </sequence>
    </complexType>
    <element name="InitializationSettings"
type="ipmpinfo:InitializationSettingsType"/>
    <complexType name="InitializationSettingsType" mixed="true">
        <sequence>
            <element ref="ipmpinfo:InitializationData"/>
        </sequence>
    </complexType>
    <element name="InitializationData" type="ipmpinfo:InitializationDataType"/>
    <complexType name="InitializationDataType" mixed="true">
        <sequence>
            <sequence minOccurs="0" maxOccurs="unbounded">
                <element ref="ipmpmsg:ControlPointID" minOccurs="0"/>
                <element ref="ipmpmsg:ControlPointAddress" minOccurs="0"/>
            </sequence>
            <element ref="ipmpmsg:Data_BaseClass" minOccurs="0"
maxOccurs="unbounded"/>
        </sequence>
    </complexType>
    <element name="RightsDescriptor" type="ipmpinfo:RightsDescriptorType"/>
    <complexType name="RightsDescriptorType">
        <sequence>
            <choice minOccurs="0">
                <element ref="ipmpinfo:License"/>
                <element ref="ipmpinfo:LicenseReference"/>
            </choice>
        </sequence>
    </complexType>
    <element name="License" type="ipmpinfo:LicenseType"/>
    <complexType name="LicenseType" mixed="true">
        <sequence>
            <element ref="r:License" maxOccurs="unbounded"/>
        </sequence>
    </complexType>
    <element name="LicenseReference" type="ipmpinfo:LicenseReferenceType"/>
    <complexType name="LicenseReferenceType">
        <simpleContent>
            <extension base="anyURI"/>
        </simpleContent>
    </complexType>
</schema>
```

E.2 IPMP General Information Descriptor Media Streaming profile schema

```
<?xml version="1.0"?>
<schema targetNamespace="urn:mpeg:mpeg21:2004:01-IPMPINFO-NS"
      xmlns="http://www.w3.org/2001/XMLSchema"
      xmlns:ipmpinfo="urn:mpeg:mpeg21:2004:01-IPMPINFO-NS"
      xmlns:dsig="http://www.w3.org/2000/09/xmldsig#"
      xmlns:r="urn:mpeg:mpeg21:2003:01-REL-R-NS"
      xmlns:ipmpmsg="urn:mpeg:mpegB:schema:IPMP-XML-MESSAGES:2007"
      xmlns:mpeg4ipmp="urn:mpeg:mpeg4:IPMPSchema:2002"
      xmlns:ipmpinfo-
msx="urn:mpeg:maf:Schema:mediastreaming:IPMPINFOextensions:2007"
```

```
      elementFormDefault="qualified" attributeFormDefault="unqualified"
version="0.01">
   <element name="IPMPGeneralInfoDescriptor"
type="ipmpinfo:IPMPGeneralInfoDescriptorType"/>
   <complexType name="IPMPGeneralInfoDescriptorType">
      <sequence>
         <element ref="ipmpinfo:ToolList" minOccurs="0"/>
         <element ref="ipmpinfo:LicenseCollection" minOccurs="0"/>
         <element ref="dsig:Signature" minOccurs="0"/>
         <!--Signature for the IPMPGeneralInfoDescriptor element and children --
>
      </sequence>
   </complexType>
   <element name="ToolList" type="ipmpinfo:ToolListType"/>
   <complexType name="ToolListType">
      <sequence>
         <element ref="ipmpinfo:ToolDescription" maxOccurs="unbounded"/>
      </sequence>
   </complexType>
   <element name="ToolDescription" type="ipmpinfo:ToolDescriptionType"/>
   <complexType name="ToolDescriptionType">
      <sequence>
         <element ref="ipmpinfo:IPMPToolID"/>
         <element ref="ipmpinfo:MemberOf" minOccurs="0"/>
         <choice minOccurs="0">
            <element ref="ipmpinfo:Inline"/>
            <element ref="ipmpinfo:Remote"/>
         </choice>
         <element ref="ipmpinfo:RightsDescriptor" minOccurs="0"/>
         <element ref="dsig:Signature" minOccurs="0"/>
      </sequence>
      <attribute name="localID" type="ID" use="required"/>
   </complexType>
   <element name="MemberOf" type="ipmpinfo:MemberOfType"/>
   <complexType name="MemberOfType">
      <sequence maxOccurs="unbounded">
         <element ref="ipmpinfo:AlternateGroup"/>
      </sequence>
   </complexType>
   <element name="AlternateGroup" type="ipmpinfo:AlternateGroupType"/>
   <complexType name="AlternateGroupType">
      <attribute name="groupID" type="positiveInteger" use="required"/>
   </complexType>
   <element name="LicenseCollection" type="ipmpinfo:LicenseCollectionType"/>
   <complexType name="LicenseCollectionType" mixed="true">
      <sequence>
         <element ref="ipmpinfo:RightsDescriptor" maxOccurs="unbounded"/>
      </sequence>
   </complexType>
</schema>
```

E.3 IPMP Information Descriptor Media Streaming profile extensions schema

```xml
<?xml version="1.0"?>
<schema
targetNamespace="urn:mpeg:maf:Schema:mediastreaming:IPMPINFOextensions:2007"
      xmlns="http://www.w3.org/2001/XMLSchema"
      xmlns:ipmpinfo-
msx="urn:mpeg:maf:Schema:mediastreaming:IPMPINFOextensions:2007"
      xmlns:dsig="http://www.w3.org/2000/09/xmldsig#"
      xmlns:rmsaf="urn:mpeg:mpeg21:2003:01-REL-R-NS"
      xmlns:mpeg4ipmp="urn:mpeg:mpeg4:IPMPSchema:2002"
      elementFormDefault="qualified" attributeFormDefault="unqualified"
version="0.01">
   <!--******************************* -->
   <!--          ToolBody              -->
   <!--******************************* -->
   <element name="ToolBody" type="ipmpinfo-msx:ToolBodyType"/>
   <complexType name="ToolBodyType">
      <sequence>
         <choice maxOccurs="unbounded">
            <element ref="ipmpinfo-msx:SingleTool"/>
            <element ref="ipmpinfo-msx:ToolPack"/>
         </choice>
         <element ref="dsig:Signature" minOccurs="0"/>
      </sequence>
   </complexType>
   <element name="ToolPack" type="ipmpinfo-msx:ToolPackType"/>
   <complexType name="ToolPackType">
      <sequence>
         <element ref="ipmpinfo-msx:ToolBodyID"/>
         <element ref="ipmpinfo-msx:DeviceInformation" minOccurs="0"/>
         <element name="ToolPackageType" type="string" minOccurs="0"/>
         <element name="ToolAgent" type="ipmpinfo-msx:ToolAgentType"/>
         <element name="ToolGroup" type="ipmpinfo-msx:ToolGroupType"
minOccurs="0"/>
         <element ref="dsig:Signature" minOccurs="0"/>
      </sequence>
   </complexType>
   <element name="ToolAgent" type="ipmpinfo-msx:ToolAgentType"/>
   <complexType name="ToolAgentType">
      <sequence>
         <element name="ToolAgentID" type="anyURI"/>
         <element name="ToolAgentCode" type="base64Binary"/>
         <element ref="dsig:Signature" minOccurs="0"/>
      </sequence>
   </complexType>
   <element name="ToolGroup" type="ipmpinfo-msx:ToolGroupType"/>
   <complexType name="ToolGroupType">
      <sequence>
         <element name="ToolGroupID" type="anyURI"/>
         <element name="ToolGroupCode" type="base64Binary"/>
         <element ref="dsig:Signature" minOccurs="0"/>
      </sequence>
   </complexType>
   <element name="SingleTool" type="ipmpinfo-msx:DRMToolType"/>
   <complexType name="DRMToolType">
      <sequence>
         <element ref="ipmpinfo-msx:ToolBodyID"/>
         <element ref="ipmpinfo-msx:DeviceInformation" minOccurs="0"/>
         <element name="ToolPackageType" type="string" minOccurs="0"/>
```

```
                <element name="ToolCode" type="base64Binary"/>
                <element ref="dsig:Signature" minOccurs="0"/>
            </sequence>
        </complexType>
    <complexType name="ToolUpdateType"/>
    <element name="ToolBodyID" type="anyURI"/>
    <!--******************************* -->
    <!--     DeviceInformation          -->
    <!--******************************* -->
    <element name="DeviceInformation" type="ipmpinfo-msx:DeviceType"/>
    <complexType name="DeviceType">
        <complexContent>
            <extension base="mpeg4ipmp:TerminalIDType">
                <sequence>
                    <element ref="ipmpinfo-msx:ToolAPI_Config" minOccurs="0"
maxOccurs="unbounded"/>
                    <element ref="ipmpinfo-msx:Others" minOccurs="0"/>
                </sequence>
            </extension>
        </complexContent>
    </complexType>
    <element name="Others" type="ipmpinfo-msx:OtherTypes"/>
    <complexType name="OtherTypes">
        <sequence>
            <any namespace="##any" processContents="lax"/>
        </sequence>
        <attribute name="ref" type="anyURI" use="required"/>
    </complexType>
    <element name="ToolAPI_Config" type="ipmpinfo-msx:ToolAPI_ConfigType"/>
    <complexType name="ToolAPI_ConfigType">
        <sequence>
            <element name="Instantiation_API_ID" type="anyURI" minOccurs="0"/>
            <element name="Messaging_API_ID" type="anyURI" minOccurs="0"/>
            <element name="OpaqueData" type="hexBinary" minOccurs="0"/>
        </sequence>
    </complexType>
</schema>
```

E.4 IPMP DIDL Media Streaming profile schema

```
<?xml version="1.0"?>
<schema xmlns:ipmpdidl="urn:mpeg:mpeg21:2004:01-IPMPDIDL-NS"
xmlns="http://www.w3.org/2001/XMLSchema" xmlns:ipmpinfo="urn:mpeg:mpeg21:2004:01-
IPMPINFO-NS" xmlns:didmodel="urn:mpeg:mpeg21:2002:02-DIDMODEL-NS"
targetNamespace="urn:mpeg:mpeg21:2004:01-IPMPDIDL-NS"
elementFormDefault="qualified" attributeFormDefault="unqualified" version="0.01">
    <import namespace="urn:mpeg:mpeg21:2002:02-DIDMODEL-NS"
schemaLocation="http://www.dmpf.org/schemas/didmodel.xsd"/>
    <import namespace="urn:mpeg:mpeg21:2004:01-IPMPINFO-NS"
schemaLocation="http://www.dmpf.org/schemas/ipmpinfo.xsd"/>
    <element name="Item" type="ipmpdidl:ItemType"
substitutionGroup="didmodel:Item"/>
    <complexType name="ItemType">
        <complexContent>
            <extension base="didmodel:ItemType">
                <sequence>
                    <group ref="ipmpdidl:IPMPDIDLChildGroup"/>
                </sequence>
```

```
            </extension>
        </complexContent>
    </complexType>
    <element name="Statement" type="ipmpdidl:StatementType"
substitutionGroup="didmodel:Statement"/>
    <complexType name="StatementType" mixed="true">
        <complexContent mixed="true">
            <extension base="didmodel:StatementType">
                <sequence>
                    <group ref="ipmpdidl:IPMPDIDLChildGroup"/>
                </sequence>
            </extension>
        </complexContent>
    </complexType>
    <element name="Resource" type="ipmpdidl:ResourceType"
substitutionGroup="didmodel:Resource"/>
    <complexType name="ResourceType" mixed="true">
        <complexContent mixed="true">
            <extension base="didmodel:ResourceType">
                <sequence>
                    <group ref="ipmpdidl:IPMPDIDLChildGroup"/>
                </sequence>
            </extension>
        </complexContent>
    </complexType>
    <element name="Presentation" type="ipmpdidl:PresentationType"
substitutionGroup="didmodel:Presentation"/>
    <complexType name="PresentationType" mixed="true">
        <complexContent mixed="true">
            <extension base="didmodel:PresentationType">
                <sequence>
                    <group ref="ipmpdidl:IPMPDIDLChildGroup"/>
                </sequence>
            </extension>
        </complexContent>
    </complexType>
    <!-- elements from here onward are unique to the IPMP DIDL Representation-->
    <group name="IPMPDIDLChildGroup">
        <sequence>
            <element ref="ipmpdidl:Identifier" minOccurs="0"/>
            <element ref="ipmpdidl:Info"/>
            <element ref="ipmpdidl:Contents"/>
        </sequence>
    </group>
    <element name="Contents">
        <complexType mixed="true">
            <sequence>
                <any namespace="##any" processContents="lax" minOccurs="0"/>
            </sequence>
            <attribute name="ref" type="anyURI"/>
        </complexType>
    </element>
    <element name="Info">
        <complexType mixed="true">
            <sequence>
                <element ref="ipmpinfo:IPMPInfoDescriptor" maxOccurs="unbounded"/>
            </sequence>
        </complexType>
    </element>
    <element name="Identifier">
        <complexType mixed="true">
```

```
            <sequence>
                <any namespace="##any" processContents="lax" minOccurs="0"/>
            </sequence>
        </complexType>
    </element>
    <element name="ProtectedAsset" type="ipmpdidl:ProtectedAssetType"/>
    <complexType name="ProtectedAssetType">
        <sequence>
            <group ref="ipmpdidl:IPMPDIDLChildGroup"/>
        </sequence>
        <attribute name="mimeType" type="string" use="required"/>
        <attribute name="contentEncoding" type="string"/>
    </complexType>
</schema>
```

Annex F
(normative)

Media Streaming Application Format file format

F.1 Introduction

Digital Items, together with included or referenced resources that are received via streaming are stored according to the MPEG-21 file format.

A Media Streaming Player MAF file is an MPEG-21 file as defined in ISO/IEC 21000-9, in which the primary item must be an MPEG-21 DIDL as defined in the clauses above. The brand for indicating compatibility with this specification is 'msmf'. In the case that this is the major brand, the minor version is '0'.

The MPEG-21 File Format is based on ISO/IEC 14496-12, which defines how to contain timed media information for a presentation.

In ISO/IEC 21000-9, files are formed as a series of objects, called boxes. All data is contained in boxes; there is no other data within the file.

F.2 Supported boxes in the Media Streaming Application Format file format

Table F.1 is a subset of the table described in ISO/IEC 21000-9, and provides a view of the encapsulation of boxes. The first three columns represent the 4CC identifying the box type; this information is displayed on three columns in order to show the nesting level of the boxes.

Table F.1 — Supported boxes

			Mandatory	Description
ftyp			yes	*file type and compatibility*
meta			yes	*Metadata*
	hdlr		yes	*handler, declares the metadata (handler) type*
	dinf			*Data information box, container*
		dref		*Data reference box*
	iloc		yes	*item location*
	iinf			*item information*
	bxml			*binary XML container*
	xml			*XML container*
	pitm			*primary item reference*
mdat				*media data container*
free				*free space*

The boxes defined in Table F.1 shall be conformant to ISO/IEC 21000-9. In a Media Streaming Player MAF, either the 'bxml' or the 'xml' box shall be present, and shall contain a Digital Item Declaration conformant to ISO/IEC 21000-2 as specified in 7.2.

Other data files as needed may appear as items in the MPEG-21 file. However, the "item protection" box is not allowed in a Media Streaming Player MAF file, as the protection information shall be expressed as specified in IPMP DIDL.

Annex G
(informative)

An Example of Media Streaming Application Format: IPTV

G.1 Scenario description

In this scenario a Content Provider Device streams resources and Digital Items on an IP network with a guaranteed Quality of Service (QoS) using the Real Time Protocol (RTP) over User Datagram Protocol (UDP). The Digital Items streamed contain, in addition to other service-related metadata, the IPMP Tools that are needed to play the resources and the corresponding licenses. Additionally, there is a separate License Provider Device, which a Media Streaming Player can access to obtain additional licenses.

A subscriber to the IPTV service can play content received depending on subscription terms and, if the license permits it, the Media Streaming Player can create a file out of that content and store it for later play. If the MSP is part of a domain, it can request and obtain a further license to copy and/or move the file and have it used by the MSPs of the domain.

G.2 Data type examples

G.2.1 Digital Items

The following example shows a Digital Item describing a list of audio and video streams inside a program. Some of the items in the program are protected, as specified in the related governance information, using ISO-IEC 21000-4 as specified in this part of ISO/IEC 23000.

```xml
<?xml version="1.0" encoding="UTF-8"?>
<DIDL xmlns="urn:mpeg:mpeg21:2006:07-DIDL-NS" xmlns:didl-
msx="urn:mpeg:maf:schema:mediastreaming:DIDLextensions"
xmlns:dii="urn:mpeg:mpeg21:2002:01-DII-NS" xmlns:ipmpdidl="urn:mpeg:mpeg21:2004:01-IPMPDIDL-NS"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:ipmpinfo="urn:mpeg:mpeg21:2004:01-
IPMPINFO-NS" xmlns:ipmpinfo-msx="urn:mpeg:maf:Schema:mediastreaming:IPMPINFOextensions:2007"
xmlns:ipmpmsg="urn:mpeg:mpeg21:schema:IPMP-XML-MESSAGES:2007" xmlns:tva ms-
maf="urn:mpeg:maf:Profile:mediastreaming:tva:2007" xmlns:r="urn:mpeg:mpeg21:2003:01-REL-R-NS"
xmlns:mx="urn:mpeg:mpeg21:2003:01-REL-MX-NS" xmlns:mpeg4ipmp="urn:mpeg:mpeg4:IPMPSchema:2002"
xmlns:dsig="http://www.w3.org/2000/09/xmldsig#"
xmlns:mp7smp="urn:mpeg:mpeg7:smp:schema:2001">
<Item id="Program3">
<Descriptor>
    <Statement mimeType="text/plain">
        <dii:Identifier>Identifier of IPTV Program 1</dii:Identifier>
    </Statement>
</Descriptor>
<Descriptor>
    <Statement mimeType="text/xml">
        <didl-msx:Metadata>
            <didl-msx:StructuredData ref="urn:urn:mpeg:maf:schema:media-
streaming:represent:metadata">
                <tva_ms-maf:TVAMain>
                    <tva ms-maf:ProgramDescription>
                        <tva ms-maf:ProgramInformationTable>
                            <tva ms-maf:ProgramInformation programId="crid://foo.com/1234567">
                                <tva_ms-maf:BasicDescription>
                                    <tva ms-maf:Title><![CDATA[Around the World in 80
Treasures]]></tva ms-maf:Title>
                                    <tva ms-maf:Synopsis length="short"><![CDATA[Dan Cruickshank
visits India and Sri Lanka as he continues his search for the world's most beautiful and precious
treasures. [S,SL]]]></tva_ms-maf:Synopsis>
```

```
                                    <tva ms-maf:Genre href="urn:tva ms-
maf:metadata:cs:ContentCS:2002:3.1.5.3">
                                            <tva_ms-maf:Name><![CDATA[History]]></tva_ms-maf:Name>
                                    </tva ms-maf:Genre>
                                    <tva ms-maf:Genre href="urn:tva ms-
maf:metadata:cs:IntentionCS:2002:1.3">
                                            <tva ms-maf:Name><![CDATA[EDUCATION]]></tva ms-maf:Name>
                                    </tva_ms-maf:Genre>
                                    <tva_ms-maf:Genre href="urn:tva ms-
maf:metadata:cs:ContentCS:2002:3.1.4">
                                            <tva ms-maf:Name><![CDATA[Arts & Media]]></tva ms-maf:Name>
                                    </tva ms-maf:Genre>
                                    <tva ms-maf:CaptionLanguage closed="true">EN-UK</tva ms-
maf:CaptionLanguage>
                                    <tva_ms-maf:SignLanguage translation="true" type="BSL">EN-
UK</tva ms-maf:SignLanguage>
                            </tva ms-maf:BasicDescription>
                            <tva ms-maf:AVAttributes>
                                <tva_ms-maf:AudioAttributes>
                                    <tva_ms-maf:NumOfChannels>2</tva_ms-maf:NumOfChannels>
                                </tva_ms-maf:AudioAttributes>
                                <tva ms-maf:VideoAttributes>
                                    <tva ms-maf:AspectRatio>16:9</tva ms-maf:AspectRatio>
                                </tva ms-maf:VideoAttributes>
                            </tva_ms-maf:AVAttributes>
                            <tva_ms-maf:MemberOf xsi:type="tva ms-maf:MemberOfType"
crid="crid://foo.com/SERAroundtheWorldin80Treasures"/>
                        </tva ms-maf:ProgramInformation>
                    </tva ms-maf:ProgramInformationTable>
                </tva ms-maf:ProgramDescription>
            </tva_ms-maf:TVAMain>
        </didl-msx:StructuredData>
    </didl-msx:Metadata>
    </Statement>
</Descriptor>
<Descriptor>
    <Statement mimeType="text/xml">
        <ipmpinfo:IPMPGeneralInfoDescriptor>
            <ipmpinfo:ToolList>
                <ipmpinfo:ToolDescription localID="TPABCDEF9">
                    <ipmpinfo:IPMPToolID>urn:foo:ToolPack:ToolID:ABCDEF9</ipmpinfo:IPMPToolID>
                    <ipmpinfo:Remote ref="http:\\www.fooToolPacks.com\ToolID:ABCDEF9"/>
                    <ipmpinfo:ConfigurationSettings>
                        <ipmpinfo:Update>
                            <ipmpinfo:Location ref="http:\\www.fooToolPacks.com\ToolPackUpdate"/>
                            <ipmpinfo:ScheduledUpdateTime periodic="P1D">2005-03-07T00:00:00
</ipmpinfo:ScheduledUpdateTime>
                        </ipmpinfo:Update>
                    </ipmpinfo:ConfigurationSettings>
                </ipmpinfo:ToolDescription>
            </ipmpinfo:ToolList>
        </ipmpinfo:IPMPGeneralInfoDescriptor>
    </Statement>
</Descriptor>
<Component>
    <Resource mimeType="application/mp21-ipmp">
        <ipmpdidl:ProtectedAsset mimeType="video/MP2P">
            <ipmpdidl:Identifier>urn:mpegRA:mpeg21:dii:isan:006A-15FA-002B-C95F-B
</ipmpdidl:Identifier>
            <ipmpdidl:Info>
                <ipmpinfo:IPMPInfoDescriptor>
                    <ipmpinfo:Tool localIDRef="TPABCDEF9"/>
                    <ipmpinfo:InitializationSettings>
                        <ipmpinfo:InitializationData>
                            <ipmpmsg:AddToolNotificationListener>
                                <ipmpmsg:dataID>98765</ipmpmsg:dataID>
                                <ipmpmsg:scope>00</ipmpmsg:scope>
                                <ipmpmsg:EventType>02</ipmpmsg:EventType>
                            </ipmpmsg:AddToolNotificationListener>
                        </ipmpinfo:InitializationData>
                    </ipmpinfo:InitializationSettings>
                    <ipmpinfo:RightsDescriptor>
                    <!-- Here is Rights Information related to IPMP Tools -->
                    </ipmpinfo:RightsDescriptor>
                    </ipmpinfo:Tool>
                    <ipmpinfo:RightsDescriptor>
```

```
                        <ipmpinfo:License>
                        <r:license licenseId="012345">...</r:license>
                        </ipmpinfo:License>
                    </ipmpinfo:RightsDescriptor>
                </ipmpinfo:IPMPInfoDescriptor>
        </ipmpdidl:Info>
        <ipmpdidl:Contents ref="myserver.com/asset.mpgencoded"/>
        </ipmpdidl:ProtectedAsset>
        </Resource>
</Component>
    <Item id="AudioStream1">
        <Descriptor>
            <Statement mimeType="text/xml">
                <dii:Identifier>urn:mpegRA:mpeg21:dii:isrc:US-ZO3-99-32476</dii:Identifier>
                <!-- ISRC identifying the sound recording -->
            </Statement>
        </Descriptor>
        <Descriptor>
            <Statement mimeType="text/xml">
                <dii:RelatedIdentifier>urn:mpegRA:mpeg21:dii:iswc:T-034.524.680-1
</dii:RelatedIdentifier>
                <!-- ISWC identifying the underlying musical work -->
            </Statement>
        </Descriptor>
        <Descriptor>
            <Statement mimeType="text/xml">
                <didl-msx:Metadata>
                    <!-- Metadata related to this Content Item is Governed now -->
                    <ipmpdidl:Info>
                        <ipmpinfo:IPMPInfoDescriptor/>
                    </ipmpdidl:Info>
                    <ipmpdidl:Contents>01234567890ABCDEF</ipmpdidl:Contents>
                    <!-- Insert the Governed - obfuscated metadata in element below -->
                </didl-msx:Metadata>
            </Statement>
        </Descriptor>
        <Component>
            <Resource ref="110xxxxx" mimeType="audio/mpeg"/>
            <!-- Audio streams are identified by a stream ID like the one above -->
        </Component>
    </Item>
    <Item id="VideoStream1">
        <Descriptor>
            <Statement mimeType="text/xml">
                <dii:Identifier>urn:mpegRA:mpeg21:dii:isan:006A-15FA-002B-B012-A</dii:Identifier>
            </Statement>
        </Descriptor>
        <Descriptor>
            <Statement mimeType="text/xml">
                <didl-msx:Metadata>
                    <didl-msx:StructuredData ref="urn:mpeg:mpeg7:schema:2001">
                        <!-- MPEG-7 SMP metadata describing the movie-->
                    </didl-msx:StructuredData>
                </didl-msx:Metadata>
            </Statement>
        </Descriptor>
        <Component>
            <Resource ref="1110xxxx" mimeType="video/mpeg"/>
            <!-- Video streams are identified by a stream ID like the one above -->
        </Component>
    </Item>
</Item>
</DIDL>
```

G.2.2 Licenses

The following example shows a license granting the play right with buffering over a broadcast program, which can be used within a Domain of devices.

The program is available at the following conditions:

- for 10 days and 12 hours after receiving the license
- available only within KOREA
- it does not allow to be accessed by more than 3 MSP devices at the same time

```xml
<?xml version="1.0" encoding="UTF-8"?>
<license xmlns="urn:mpeg:mpeg21:2003:01-REL-R-NS" xmlns:mx="urn:mpeg:mpeg21:2003:01-REL-MX-NS"
xmlns:dacx="urn:mpeg:mpeg21:2006:01-REL-DACX-NS" xmlns:dsig="http://www.w3.org/2000/09/xmldsig#"
xmlns:xenc="http://www.w3.org/2001/04/xmlenc#" xmlns:r="urn:mpeg:mpeg21:2003:01-REL-R-NS"
xmlns:sx="urn:mpeg:mpeg21:2003:01-REL-SX-NS" xmlns:bpx="urn:mpeg:mpeg21:2005:01-REL-BPX-NS"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" sx:profileCompliance="dmp-IDP2-rel-1.0"
xsi:schemaLocation="urn:mpeg:mpeg21:2006:01-REL-DACX-NS rel-dacx-v1.xsd">
    <grant>
        <bpx:identityHolder>
            <bpx:idSystem>urn:mpeg:mpeg21:2006-01-REL-DACX-NS:DM-1000:DO-0001</bpx:idSystem>
            <bpx:idValue>DE0001</bpx:idValue>
        </bpx:identityHolder>
        <mx:play/>
        <bpx:protectedResource>
            <digitalResource>
                <nonSecureIndirect URI="urn:uci:foo-10357"/>
            </digitalResource>
            <xenc:EncryptedKey>
                <xenc:CipherData>
                    <xenc:CipherValue>
ujnDATAPgvq5dPDvTGPPhJIpqnSieHWK2BEn2JYi2AgiTWtTqSsCIqg/76hHCmzSHAXrFaqTl/Zi3LtbXoCV
MoDXgMFkUGIWVyLGDFmq5VxyOwzYM/WMWCEMF1qIUtKW62chDiPaEOfY6dPFyHxtUi4wXMpd3TcIYwV/QTQDMDg=
                    </xenc:CipherValue>
                </xenc:CipherData>
            </xenc:EncryptedKey>
        </bpx:protectedResource>
        <allConditions>
            <sx:validityIntervalFloating>
                <sx:duration>P10DT12H</sx:duration>
            </sx:validityIntervalFloating>
            <sx:territory>
                <sx:location>
                    <sx:country>KR</sx:country>
                </sx:location>
            </sx:territory>
            <dacx:destinationPrincipal>
                <bpx:identityHolder>
                    <bpx:idSystem>urn:mpeg:mpeg21:2006-01-REL-DACX-NS:DM-1000</bpx:idSystem>
<bpx:idValue>DO0001</bpx:idValue>
                </bpx:identityHolder>
            </dacx:destinationPrincipal>
            <dacx:simultaneousAccessCount>
                <dacx:count>3</dacx:count>
            </dacx:simultaneousAccessCount>
        </allConditions>
    </grant>
    <issuer>
        <keyHolder>
            <info>
                <dsig:KeyName>Issuer's signing key</dsig:KeyName>
            </info>
        </keyHolder>
    </issuer>
</license>
```

G.2.3 IPMP Components, etc.

The following example shows an IPMPGeneralInfoDescriptor element conveying a set of information related to an IPMP Tool required to process protected content.

```xml
<ipmpinfo:IPMPGeneralInfoDescriptor>
    <ipmpinfo:ToolList>
        <ipmpinfo:ToolDescription localID="TPABCDEF9">
            <ipmpinfo:IPMPToolID>urn:foo:ToolPack:ToolID:ABCDEF9</ipmpinfo:IPMPToolID>
```

```
                <ipmpinfo:Remote ref="http:\\www.fooToolPacks.com\ToolID:ABCDEF9"/>
                <ipmpinfo:ConfigurationSettings>
                    <ipmpinfo:Update>
                        <ipmpinfo:Location ref="http:\\www.fooToolPacks.com\ToolPackUpdate"/>
                        <ipmpinfo:ScheduledUpdateTime periodic="P1D">2005-03-07T00:00:00
</ipmpinfo:ScheduledUpdateTime>
                    </ipmpinfo:Update>
                </ipmpinfo:ConfigurationSettings>
            </ipmpinfo:ToolDescription>
        </ipmpinfo:ToolList>
</ipmpinfo:IPMPGeneralInfoDescriptor>
```

The following example shows the declaration of a Resource protected by the IPMP Tool declared in the figure above.

```
<Resource mimeType="application/mp21-ipmp">
    <ipmpdidl:ProtectedAsset mimeType="video/MP2P">
        <ipmpdidl:Identifier>urn:mpegRA:mpeg21:dii:isan:006A-15FA-002B-C95F-B</ipmpdidl:Identifier>
            <ipmpdidl:Info>
                <ipmpinfo:IPMPInfoDescriptor>
                    <ipmpinfo:Tool localIDRef="TPABCDEF9"/>
                    <ipmpinfo:InitializationSettings>
                        <ipmpinfo:InitializationData>
                            <ipmpmsg:AddToolNotificationListener>
                                <ipmpmsg:dataID>98765</ipmpmsg:dataID>
                                <ipmpmsg:scope>00</ipmpmsg:scope>
                                <ipmpmsg:EventType>02</ipmpmsg:EventType>
                            </ipmpmsg:AddToolNotificationListener>
                        </ipmpinfo:InitializationData>
                    </ipmpinfo:InitializationSettings>
                    <ipmpinfo:RightsDescriptor>
                        <!-- Here is Rights Information related to IPMP Tools -->
                    </ipmpinfo:RightsDescriptor>
                    </ipmpinfo:Tool>
                    <ipmpinfo:RightsDescriptor>
                        <ipmpinfo:License>
                            <r:license licenseId="012345">
                            </r:license>
                        </ipmpinfo:License>
                    </ipmpinfo:RightsDescriptor>
                </ipmpinfo:IPMPInfoDescriptor>
            </ipmpdidl:Info>
        <ipmpdidl:Contents ref="myserver.com/asset.mpgencoded"/>
    </ipmpdidl:ProtectedAsset>
</Resource>
```

G.2.4 Domain Management

The example below shows a Domain Membership license sent by a DMD to a Media Streaming Player Granting the Media Streaming Player the membership to the Domain Identified by "urn:Mydomains:5555"

```
<?xml version="1.0" encoding="UTF-8"?>
<license xmlns="urn:mpeg:mpeg21:2003:01-REL-R-NS" xmlns:mx="urn:mpeg:mpeg21:2003:01-REL-MX-NS"
xmlns:m2x="urn:mpeg:mpeg21:2006:01-REL-M2X-NS" xmlns:dsig="http://www.w3.org/2000/09/xmldsig#"
xmlns:xenc="http://www.w3.org/2001/04/xmlenc#" xmlns:r="urn:mpeg:mpeg21:2003:01-REL-R-NS"
xmlns:sx="urn:mpeg:mpeg21:2003:01-REL-SX-NS" xmlns:m1x="urn:mpeg:mpeg21:2005:01-REL-M1X-NS"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" sx:profileCompliance="dmp-IDP2-rel-1.0"
xsi:schemaLocation="urn:mpeg:mpeg21:2006:01-REL-M2X-NS http://www.dmpf.org/schemas/rel-m2x-dac-
v1.xsd">
    <grant>
        <keyHolder>
            <info>
                <dsig:KeyName>My_MSP_public_key</dsig:KeyName>
                <dsig:KeyValue>
                    <dsig:RSAKeyValue>
                        <dsig:Modulus>01234567</dsig:Modulus>
                        <dsig:Exponent>89ABCDEF</dsig:Exponent>
                    </dsig:RSAKeyValue>
                </dsig:KeyValue>
            </info>
```

```
                </keyHolder>
                <possessProperty/>
                <m1x:protectedResource>
                    <digitalResource>
                        <nonSecureIndirect URI="urn:Mydomains:5555"/>
                    </digitalResource>
                    <xenc:EncryptedKey>
                        <xenc:EncryptionMethod Algorithm="http://www.w3.org/2001/04/xmlenc#kw-aes128"/>
                        <xenc:CipherData>
                            <xenc:CipherValue>ABABABAB</xenc:CipherValue>
                        </xenc:CipherData>
                        <xenc:CarriedKeyName>Subscriber license Key</xenc:CarriedKeyName>
                    </xenc:EncryptedKey>
                </m1x:protectedResource>
                <r:allConditions>
                    <validityInterval>
                        <notBefore>2007-03-01T00:00:00</notBefore>
                        <notAfter>2007-04-30T00:00:00</notAfter>
                    </validityInterval>
                    <sx:territory>
                        <sx:location>
                            <sx:country>IT</sx:country>
                        </sx:location>
                    </sx:territory>
                </r:allConditions>
            </grant>
            <issuer>
                <keyHolder>
                    <info>
                        <dsig:KeyName>DMD Public Key</dsig:KeyName>
                        <dsig:KeyValue>
                            <dsig:RSAKeyValue>
                                <dsig:Modulus>12121212</dsig:Modulus>
                                <dsig:Exponent>34343434</dsig:Exponent>
                            </dsig:RSAKeyValue>
                        </dsig:KeyValue>
                    </info>
                </keyHolder>
            </issuer>
        </license>
```

The example below shows a license Granting all Devices part of the Domain Identified by "urn:Mydomains:5555" the right to play the resource: "urn:broadcast:news:2005_07_10-12H-00M".

```
<?xml version="1.0" encoding="UTF-8"?>
<license xmlns="urn:mpeg:mpeg21:2003:01-REL-R-NS" xmlns:mx="urn:mpeg:mpeg21:2003:01-REL-MX-NS"
xmlns:m2x="urn:mpeg:mpeg21:2006:01-REL-M2X-NS" xmlns:dsig="http://www.w3.org/2000/09/xmldsig#"
xmlns:xenc="http://www.w3.org/2001/04/xmlenc#" xmlns:r="urn:mpeg:mpeg21:2003:01-REL-R-NS"
xmlns:sx="urn:mpeg:mpeg21:2003:01-REL-SX-NS" xmlns:m1x="urn:mpeg:mpeg21:2005:01-REL-M1X-NS"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" sx:profileCompliance="dmp-IDP2-rel-1.0"
xsi:schemaLocation="urn:mpeg:mpeg21:2006:01-REL-M2X-NS http://www.dmpf.org/schemas/rel-m2x-dac-
v1.xsd">
    <grant>
        <m1x:identityHolder>
            <m1x:idValue> urn:Mydomains:5555</m1x:idValue>
        </m1x:identityHolder>
        <mx:play/>
        <m1x:protectedResource licensePartId="news">
            <digitalResource>
                <nonSecureIndirect URI="urn:broadcast:news:2005 07 10-12H-00M"/>
            </digitalResource>
            <xenc:EncryptedKey>
                <xenc:EncryptionMethod Algorithm="http://www.w3.org/2001/04/xmlenc#kw-aes128"/>
                <xenc:CipherData>
                    <xenc:CipherValue>CDCDCDCD</xenc:CipherValue>
                </xenc:CipherData>
                <xenc:CarriedKeyName>Master Key encrypted with the Domain Key</xenc:CarriedKeyName>
            </xenc:EncryptedKey>
        </m1x:protectedResource>
        <r:allConditions>
            <sx:territory>
                <sx:location>
                    <sx:country>IT</sx:country>
```

```
                </sx:location>
            </sx:territory>
        </r:allConditions>
    </grant>
    <issuer>
        <keyHolder>
            <info>
                <dsig:KeyName>LPD_Public_Key</dsig:KeyName>
                <dsig:KeyValue>
                    <dsig:RSAKeyValue>
                        <dsig:Modulus>56565656</dsig:Modulus>
                        <dsig:Exponent>78787878</dsig:Exponent>
                    </dsig:RSAKeyValue>
                </dsig:KeyValue>
            </info>
        </keyHolder>
    </issuer>
</license>
```

G.2.5 DIS

The example below shows an extract of the metadata related to a media resource to be streamed with related metadata. In particular, each VideoSegment elements shall be streamed before the time indicated by the MediaTimePoint element, as this is the time in which the data shall be displayed to the user by the Media Streaming Player.

```
<ns13:Metadata>
    <ns13:StructuredData ref="urn:mpeg:mpeg7:smp:schema:2001">
        <ns22:Mpeg7>
            <ns22:Description xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:type="ns22:CreationDescriptionType">
                <ns22:CreationInformation>
                    <ns22:Creation>
                        <ns22:Title type="Main Title">AIR - Free fly</ns22:Title>
                        <ns22:TitleMedia>
                        <ns22:Abstract>
                            <ns22:FreeTextAnnotation>Acrobatic figures in the
sky</ns22:FreeTextAnnotation>
                        </ns22:Abstract>
                        <ns22:Creator>
                            <ns22:Role href="urn:mpeg:mpeg7:RoleCS:2001:PRODUCER">
            </ns22:Role>
                            <ns22:Agent xsi:type="ns22:PersonType">
                                <ns22:Name>
                                    <ns22:GivenName>JFPConsulting</ns22:GivenName>
                                    <ns22:FamilyName/>
                                </ns22:Name>
                            </ns22:Agent>
                        </ns22:Creator>
                        <ns22:CreationCoordinates>
                            <ns22:Date>
                                <ns22:TimePoint>2007-04-19T00:00:00</ns22:TimePoint>
                            </ns22:Date>
                        </ns22:CreationCoordinates>
                        <ns22:CopyrightString>(C) JFPConsulting</ns22:CopyrightString>
                    </ns22:Creation>
                    <ns22:Classification>
                        <ns22:Genre href="urn:mpeg:mpeg7:cs:GenreCS:2001:4.7">
                            <ns22:Name xml:lang="en">Sports/Adventure</ns22:Name>
                        </ns22:Genre>
                    </ns22:Classification>
                </ns22:CreationInformation>
            </ns22:Description>
            <!-- ############################ -->
            <!-- Elements to be streamed are below -->
            <!-- ############################ -->
            <ns22:Description xsi:type="ns22:ContentEntityType">
                <ns22:MultimediaContent xsi:type="ns22:VideoType">
                    <ns22:Video>
                        <ns22:TemporalDecomposition>
                            <ns22:VideoSegment>
                                <ns22:TextAnnotation type="scene" relevance="1" confidence="1">
                                    <ns22:FreeTextAnnotation>Ready?</ns22:FreeTextAnnotation>
```

```
                                        </ns22:TextAnnotation>
                                        <ns22:MediaTime>
                                             <ns22:MediaTimePoint>T00:00:03:16F25</ns22:MediaTimePoint>
                                             <ns22:MediaIncrDuration
mediaTimeUnit="PT1N25F">204</ns22:MediaIncrDuration>
                                        </ns22:MediaTime>
                                        <ns22:TemporalDecomposition>
                                             <ns22:VideoSegment>
                                                  <ns22:MediaTime>

    <ns22:MediaTimePoint>T00:00:07:17F25</ns22:MediaTimePoint>
                                                  </ns22:MediaTime>
                                             </ns22:VideoSegment>
                                        </ns22:TemporalDecomposition>
                                   </ns22:VideoSegment>
                                   <ns22:VideoSegment>
                                        <ns22:TextAnnotation type="scene" relevance="1" confidence="1">
                                             <ns22:FreeTextAnnotation>GO!!</ns22:FreeTextAnnotation>
                                        </ns22:TextAnnotation>
                                        <ns22:MediaTime>
                                             <ns22:MediaTimePoint>T00:00:12:2F25</ns22:MediaTimePoint>
                                             <ns22:MediaIncrDuration
mediaTimeUnit="PT1N25F">149</ns22:MediaIncrDuration>
                                        </ns22:MediaTime>
                                        <ns22:TemporalDecomposition>
                                             <ns22:VideoSegment>
                                                  <ns22:MediaTime>

    <ns22:MediaTimePoint>T00:00:15:1F25</ns22:MediaTimePoint>
                                                  </ns22:MediaTime>
                                             </ns22:VideoSegment>
                                        </ns22:TemporalDecomposition>
                                   </ns22:VideoSegment>
                                   <ns22:VideoSegment>
                                        <ns22:TextAnnotation type="scene" relevance="1" confidence="1">
                                             <ns22:FreeTextAnnotation>spinning above the
clouds...</ns22:FreeTextAnnotation>
                                        </ns22:TextAnnotation>
                                        <ns22:MediaTime>
                                             <ns22:MediaTimePoint>T00:00:18:8F25</ns22:MediaTimePoint>
                                             <ns22:MediaIncrDuration
mediaTimeUnit="PT1N25F">161</ns22:MediaIncrDuration>
                                        </ns22:MediaTime>
                                        <ns22:TemporalDecomposition>
                                             <ns22:VideoSegment>
                                                  <ns22:MediaTime>

    <ns22:MediaTimePoint>T00:00:19:9F25</ns22:MediaTimePoint>
                                                  </ns22:MediaTime>
                                             </ns22:VideoSegment>
                                        </ns22:TemporalDecomposition>
                                   </ns22:VideoSegment>
                              </ns22:TemporalDecomposition>
                         </ns22:Video>
                    </ns22:MultimediaContent>
               </ns22:Description>
          <!-- ############################ -->
          <!-- Elements to be streamed are above -->
          <!-- ############################ -->
     </ns22:Mpeg7>
   </ns13:StructuredData>
</ns13:Metadata>
```

The following figure shows a BBL document for streaming the metadata above as for the requirement above.

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE BBL [
    <!ENTITY MP7DCIMetadataPath
"did:Item/did:Descriptor[2]/did:Statement/dmprc:DMPInformation/dmprc:Metadata/dmprc:StructuredData/mp
eg7:Mpeg7">
    <!ENTITY MP7DCIMetadataID         "MP7DCIMetadata">
    <!ENTITY MP7B1CreationInfoPath
"did:Item/did:Item[2]/did:Descriptor[2]/did:Statement/dmprc:DMPInformation/dmprc:Metadata/dmprc:Struc
turedData/mpeg7:Mpeg7/mpeg7:Description[contains(@xsi:type,'CreationDescriptionType')]">
```

```
    <!ENTITY MP7B1CreationInfoID       "MP7B1CreationInfo">
    <!ENTITY MP7B1VideoInfoPath
"did:Item/did:Item[2]/did:Descriptor[2]/did:Statement/dmprc:DMPInformation/dmprc:Metadata/dmprc:Struc
turedData/mpeg7:Mpeg7/mpeg7:Description[contains(@xsi:type,'ContentEntityType')]">
    <!ENTITY MP7B1VideoInfoID          "MP7B1VideoInfo">
    <!ENTITY MP7B2CreationInfoPath
"did:Item/did:Item[3]/did:Descriptor[2]/did:Statement/dmprc:DMPInformation/dmprc:Metadata/dmprc:Struc
turedData/mpeg7:Mpeg7/mpeg7:Description[contains(@xsi:type,'CreationDescriptionType')]">
    <!ENTITY MP7B2CreationInfoID       "MP7B2CreationInfo">
    <!ENTITY MP7B2VideoInfoPath
"did:Item/did:Item[3]/did:Descriptor[2]/did:Statement/dmprc:DMPInformation/dmprc:Metadata/dmprc:Struc
turedData/mpeg7:Mpeg7/mpeg7:Description[contains(@xsi:type,'ContentEntityType')]">
    <!ENTITY MP7B2VideoInfoID          "MP7B2VideoInfo">
    <!ENTITY MP7B3CreationInfoPath
"did:Item/did:Item[4]/did:Descriptor[2]/did:Statement/dmprc:DMPInformation/dmprc:Metadata/dmprc:Struc
turedData/mpeg7:Mpeg7/mpeg7:Description[contains(@xsi:type,'CreationDescriptionType')]">
    <!ENTITY MP7B3CreationInfoID       "MP7B3CreationInfo">
    <!ENTITY MP7B3VideoInfoPath
"did:Item/did:Item[4]/did:Descriptor[2]/did:Statement/dmprc:DMPInformation/dmprc:Metadata/dmprc:Struc
turedData/mpeg7:Mpeg7/mpeg7:Description[contains(@xsi:type,'ContentEntityType')]">
    <!ENTITY MP7B3VideoInfoID          "MP7B3VideoInfo">
    <!ENTITY MP7B4CreationInfoPath
"did:Item/did:Item[5]/did:Descriptor[2]/did:Statement/dmprc:DMPInformation/dmprc:Metadata/dmprc:Struc
turedData/mpeg7:Mpeg7/mpeg7:Description[contains(@xsi:type,'CreationDescriptionType')]">
    <!ENTITY MP7B4CreationInfoID       "MP7B4CreationInfo">
    <!ENTITY MP7B4VideoInfoPath
"did:Item/did:Item[5]/did:Descriptor[2]/did:Statement/dmprc:DMPInformation/dmprc:Metadata/dmprc:Struc
turedData/mpeg7:Mpeg7/mpeg7:Description[contains(@xsi:type,'ContentEntityType')]">
    <!ENTITY MP7B4VideoInfoID          "MP7B4VideoInfo">
    <!ENTITY MP7VideoSegmentPath
"mpeg7:MultimediaContent/mpeg7:Video/mpeg7:TemporalDecomposition/mpeg7:VideoSegment">
    ]>
<BBL xmlns="urn:mpeg:mpeg21:2007:01-BBL-NS" xmlns:bbl="urn:mpeg:mpeg21:2007:01-BBL-NS"
    xmlns:Hudp="http://whisper.elec.uow.edu.au/mpeg/mpegA/ms/AEdemo/bbl/handler/UDP"
    xmlns:did="urn:dmp:idp2:mpeg21:2002:02-DIDL-NS:2006:02"
    xmlns:dii="urn:dmp:idp1:mpeg21:2002:01-DII-NS:2005:04"
    xmlns:ipmpdidl="urn:mpeg:mpeg21:2004:01-IPMPDIDL-NS"
    xmlns:ipmpinfo="urn:dmp:idp2:mpeg21:2004:01-IPMPINFO-NS:2006:02"
    xmlns:mpeg7="urn:mpeg:mpeg7:smp:schema:2001"
    xmlns:dmprc="urn:dmp:idp2:Represent:Content:2006:02"
    xmlns:dmprm="urn:dmp:Represent:Metadata"
    xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
    xsi:schemaLocation="
    urn:mpeg:mpeg21:2007:01-BBL-NS                   schemas/bbl-CE8819.xsd
    urn:mpeg:mpeg21:2002:02-DIDL-NS                  schemas/didl.xsd
    urn:mpeg:mpeg21:2004:01-IPMPDIDL-NS              schemas/ipmpdidl.xsd
    urn:mpeg:mpeg21:2004:01-IPMPINFO-NS              schemas/ipmpinfo.xsd
    urn:mpeg:mpeg7:schema:2001                       schemas/MPEG7_SimpleProfile.xsd
    urn:dmp:Represent:Content:2005:04-DMP-RC-NS schemas/dmprc.xsd
    http://whisper.elec.uow.edu.au/mpeg/mpegA/ms/AEdemo/bbl/handler/UDP schemas/UDP-Handler.xsd">
    <Instance id="Instance" xmlSource="AIR Complete-DCI.xml" timeScheme="npt">

        <Variables>
            <Define bbl:name="count" bbl:value="-1"/>
            <Define bbl:name="segmentID" bbl:value="''"/>
        </Variables>

        <Register>
            <!-- Default handler - a simple UDP handler for purposes of the demo -->
            <!-- http://whisper.elec.uow.edu.au/mpeg/mpeg21/dis/handler/UDP -->
            <Handler id="metadataHandler"
handlerURI="http://whisper.elec.uow.edu.au/mpeg/mpegA/ms/AEdemo/bbl/handler/UDP">
                <Hudp:port>30000</Hudp:port>
            </Handler>
            <!--
            <Handler id="videoHandler"
handlerURI="http://whisper.elec.uow.edu.au/mpeg/mpegA/ms/AEdemo/bbl/handler/UDP">
            <Hudp:port>30001</Hudp:port>
            </Handler>
            <Handler id="audioHandler"
handlerURI="http://whisper.elec.uow.edu.au/mpeg/mpegA/ms/AEdemo/bbl/handler/UDP">
            <Hudp:port>30002</Hudp:port>
            </Handler>
            -->
            <Function bbl:name="bbl:mpeg7TimeConvert" args="2">
                <!-- Converts an MPEG-7 MediaIncrDuration to NPT -->
```

```
                <![CDATA[
function mpeg7TimeConvert( mpeg7Elt ) {

  var result = -1;

  if( mpeg7Elt.localName == "MediaIncrDuration" ) {

    // Obtain the constituent parts of the MediaIncrDuration
    var unit = mpeg7Elt.getAttribute( "mediaTimeUnit" );
    var PTindex = unit.indexOf( "PT" );
    var Nindex = unit.indexOf( "N" );
    var Findex = unit.indexOf( "F" );
    var N = unit.slice( PTindex + 2, Nindex );
    var F = unit.slice( Nindex + 1, Findex );
    var value = mpeg7Elt.textContent;

    // Convert it to number of seconds (which also gives us NPT).
    var result = value * N / F;
  }
  return result;
}
                ]]>
            </Function>
        </Register>

        <!-- Random Access Packet - contains skeleton of DID -->
        <Packet id="DIDLSkeleton" deliveryTime="1.0">
            <Content>
                <Include ref="/did:DIDL" depth="6">
                    <Include

    ref="/did:DIDL/did:Item/did:Descriptor/did:Statement/dmprc:DMPInformation/dmprc:Metadata/dmprc:St
ructuredData/mpeg7:Mpeg7"/>
                    <Include depth="-1"

    ref="/did:DIDL/did:Item/did:Descriptor/did:Statement/ipmpinfo:IPMPGeneralInfoDescriptor/ipmpinfo:
ToolList/ipmpinfo:ToolDescription/ipmpinfo:IPMPToolID"/>
                    <Include depth="2"

    ref="/did:DIDL/did:Item/did:Item/did:Descriptor[2]/did:Statement/dmprc:DMPInformation/dmprc:Metad
ata/dmprc:StructuredData">
                    </Include>
                    <Attribute bbl:name="xmlns:bbl" bbl:match=".">
                        <value-of select="'urn:mpeg:mpeg21:2007:01-BBL-NS'"/>
                    </Attribute>
                    <Attribute bbl:name="bbl:namespaceContextNode" bbl:match=".">
                        <value-of select="'true'"/>
                    </Attribute>
                    <Attribute bbl:name="bbl:rap" bbl:match=".">
                        <value-of select="'true'"/>
                    </Attribute>
                    <Attribute bbl:name="bbl:fragmentRef" bbl:match="./&MP7DCIMetadataPath;">
                        <value-of select="'&MP7DCIMetadataID;'"/>
                    </Attribute>
                    <Attribute bbl:name="bbl:fragmentRef" bbl:match="./&MP7B1CreationInfoPath;">
                        <value-of select="'&MP7B1CreationInfoID;'"/>
                    </Attribute>
                    <Attribute bbl:name="bbl:fragmentRef" bbl:match="./&MP7B1VideoInfoPath;">
                        <value-of select="'&MP7B1VideoInfoID;'"/>
                    </Attribute>
                    <Attribute bbl:name="bbl:fragmentRef" bbl:match="./&MP7B2CreationInfoPath;">
                        <value-of select="'&MP7B2CreationInfoID;'"/>
                    </Attribute>
                    <Attribute bbl:name="bbl:fragmentRef" bbl:match="./&MP7B2VideoInfoPath;">
                        <value-of select="'&MP7B2VideoInfoID;'"/>
                    </Attribute>
                    <Attribute bbl:name="bbl:fragmentRef" bbl:match="./&MP7B3CreationInfoPath;">
                        <value-of select="'&MP7B3CreationInfoID;'"/>
                    </Attribute>
                    <Attribute bbl:name="bbl:fragmentRef" bbl:match="./&MP7B3VideoInfoPath;">
                        <value-of select="'&MP7B3VideoInfoID;'"/>
                    </Attribute>
                    <Attribute bbl:name="bbl:fragmentRef" bbl:match="./&MP7B4CreationInfoPath;">
                        <value-of select="'&MP7B4CreationInfoID;'"/>
                    </Attribute>
                    <Attribute bbl:name="bbl:fragmentRef" bbl:match="./&MP7B4VideoInfoPath;">
```

```
                            <value-of select="'&MP7B4VideoInfoID;'"/>
                        </Attribute>
                    </Include>
                </Content>
            </Packet>

        <!-- Item B1 MPEG7 Video metadata -->
        <Packet deliveryTime="2.0">
            <Content>
                <Include ref="/did:DIDL/&MP7B1VideoInfoPath;" depth="4">
                    <Attribute bbl:name="bbl:fragmentID" bbl:match=".">
                        <value-of select="'&MP7B1VideoInfoID;'"/>
                    </Attribute>
                    <Attribute bbl:name="bbl:fragmentRef" bbl:match="./&MP7VideoSegmentPath;[1]">
                        <value-of select="'b1_segment0'"/>
                    </Attribute>
                    <Attribute bbl:name="bbl:fragmentRef" bbl:match="./&MP7VideoSegmentPath;[2]">
                        <value-of select="'b1 segment1'"/>
                    </Attribute>
                    <Attribute bbl:name="bbl:fragmentRef" bbl:match="./&MP7VideoSegmentPath;[3]">
                        <value-of select="'b1 segment2'"/>
                    </Attribute>
                    <Attribute bbl:name="bbl:fragmentRef" bbl:match="./&MP7VideoSegmentPath;[4]">
                        <value-of select="'b1 segment3'"/>
                    </Attribute>
                    <Attribute bbl:name="bbl:fragmentRef" bbl:match="./&MP7VideoSegmentPath;[5]">
                        <value-of select="'b1 segment4'"/>
                    </Attribute>
                    <Attribute bbl:name="bbl:fragmentRef" bbl:match="./&MP7VideoSegmentPath;[6]">
                        <value-of select="'b1 segment5'"/>
                    </Attribute>
                    <Attribute bbl:name="bbl:fragmentRef" bbl:match="./&MP7VideoSegmentPath;[7]">
                        <value-of select="'b1 segment6'"/>
                    </Attribute>
                    <Attribute bbl:name="bbl:fragmentRef" bbl:match="./&MP7VideoSegmentPath;[8]">
                        <value-of select="'b1 segment7'"/>
                    </Attribute>
                    <Attribute bbl:name="bbl:fragmentRef" bbl:match="./&MP7VideoSegmentPath;[9]">
                        <value-of select="'b1 segment8'"/>
                    </Attribute>
                </Include>
            </Content>
        </Packet>

        <!-- Stream each VideoSegment one after the other -->
        <PacketStream id="videoSegmentPackets" deliveryTime="3.5">
            <ContentTemplate>
                <Include ref="/did:DIDL/&MP7B1VideoInfoPath;/&MP7VideoSegmentPath;"
                    depth="3">
                    <Timing>
                        <Durations bbl:match="."
    bbl:value="bbl:mpeg7TimeConvert(./mpeg7:VideoSegment/mpeg7:MediaTime/mpeg7:MediaIncrDuration)"/>
                    </Timing>
                    <Fragmentation>
                        <count value="1" bbl:match="."/>
                    </Fragmentation>
                    <Attribute bbl:name="bbl:fragmentID" bbl:match=".">
                        <value-of select="$segmentID"/>
                    </Attribute>
                </Include>
            </ContentTemplate>
            <Variables>
                <Assign bbl:name="count" bbl:value="$count + 1"/>
                <Assign bbl:name="segmentID" bbl:value="concat('b1_segment',$count)"/>
            </Variables>
        </PacketStream>

    </Instance>
</BBL>
```

Annex H
(informative)

An Example of Media Streaming Application Format:
Digital Broadcasting without return channel

H.1 Scenario description

In this scenario, the Content Provider Device streams resources and Digital Items on a radio channel (in the terrestrial or satellite bands) using the MPEG-2 Transport Stream. The Digital Items streamed contain, in addition to other service-related metadata, the IPMP Tools that are needed to play the resources and the corresponding licenses.

A subscriber to the TV service can play content received depending on subscription terms and different services may have different licenses. If the license for a particular content permits it, the Media Streaming Player can create a file out of that content and store it. If the subscriber has its MSPs part of a domain and the subscription/license allows so, the MSP can create and store a file with that content and copy and/or move to and have the file used by the MSPs of the domain.

H.2 Data type examples

H.2.1 DI

The following example shows a Digital Item describing an MPEG-2 broadcasting program containing an audio and video stream with program and governance information of the Media Streaming Player.

```
<?xml version="1.0" encoding="UTF-8"?>
<DIDL xmlns="urn:mpeg:mpeg21:2006:07-DIDL-NS" xmlns:didl-msx="
urn:mpeg:maf:schema:mediastreaming:DIDLextensions"
xmlns:dii="urn:mpeg:mpeg21:2002:01-DII-NS" xmlns:ipmpdidl="urn:mpeg:mpeg21:2004:01-IPMPDIDL-NS"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:ipmpinfo="urn:mpeg:mpeg21:2004:01-
IPMPINFO-NS" xmlns:ipmpinfo-msx="urn:mpeg:maf:Schema:mediastreaming:IPMPINFOextensions:2007"
xmlns:ipmpmsg="urn:mpeg:mpegB:schema:IPMP-XML-MESSAGES:2007" xmlns:tva ms-
maf="urn:mpeg:maf:Profile:mediastreaming:tva:2007" xmlns:r="urn:mpeg:mpeg21:2003:01-REL-R-NS"
xmlns:mx="urn:mpeg:mpeg21:2003:01-REL-MX-NS" xmlns:mpeg4ipmp="urn:mpeg:mpeg4:IPMPSchema:2002"
xmlns:dsig="http://www.w3.org/2000/09/xmldsig#"
xmlns:mp7smp="urn:mpeg:mpeg7:smp:schema:2001">
<Item id="Program3">
<Descriptor>
    <Statement mimeType="text/plain">
        <dii:Identifier>Identifier of Broadcasting Program</dii:Identifier>
    </Statement>
</Descriptor>
<Descriptor>
    <Statement mimeType="text/xml">
        <didl-msx:Metadata>
            <didl-msx:StructuredData ref="urn:urn:mpeg:maf:schema:media-
streaming:represent:metadata">
                <tva ms-maf:TVAMain>
                    <tva ms-maf:ProgramDescription>
                    <!-- TVA Program metadata information -->
                    </tva_ms-maf:ProgramDescription>
                </tva ms-maf:TVAMain>
            </didl-msx:StructuredData>
        </didl-msx:Metadata>
    </Statement>
</Descriptor>
<Descriptor>
    <Statement mimeType="text/xml">
        <ipmpinfo:IPMPGeneralInfoDescriptor>
```

```
                <ipmpinfo:ToolList>
                    <ipmpinfo:ToolDescription localID="TPABCDEF9">
                        <ipmpinfo:IPMPToolID>urn:foo:ToolPack:ToolID:ABCDEF9</ipmpinfo:IPMPToolID>
                        <ipmpinfo:Remote ref="http:\\www.fooToolPacks.com\ToolID:ABCDEF9"/>
                        <ipmpinfo:ConfigurationSettings>
                            <ipmpinfo:Update>
                                <ipmpinfo:Location ref="http:\\www.fooToolPacks.com\ToolPackUpdate"/>
                                <ipmpinfo:ScheduledUpdateTime periodic="P1D"> 2005-03-07T00:00:00
</ipmpinfo:ScheduledUpdateTime>
                            </ipmpinfo:Update>
                        </ipmpinfo:ConfigurationSettings>
                    </ipmpinfo:ToolDescription>
                </ipmpinfo:ToolList>
            </ipmpinfo:IPMPGeneralInfoDescriptor>
        </Statement>
</Descriptor>
<Component>
    <Resource mimeType="application/mp21-ipmp">
        <ipmpdidl:ProtectedAsset mimeType="video/MP2P">
            <ipmpdidl:Identifier>urn:mpegRA:mpeg21:dii:isan:006A-15FA-002B-C95F-B
</ipmpdidl:Identifier>
            <ipmpdidl:Info>
                <ipmpinfo:IPMPInfoDescriptor>
                    <ipmpinfo:Tool localIDRef="TPABCDEF9"/>
                    <ipmpinfo:InitializationSettings>
                        <ipmpinfo:InitializationData>
                        <!-- IPMP Messages for initialization of IPMP Tool/ToolPack -->
                        </ipmpinfo:InitializationData>
                    </ipmpinfo:InitializationSettings>
                    <ipmpinfo:RightsDescriptor>
                    <!-- Here is Rights Information related to IPMP Tools -->
                    </ipmpinfo:RightsDescriptor>
                    </ipmpinfo:Tool>
                </ipmpinfo:IPMPInfoDescriptor>
            </ipmpdidl:Info>
            <ipmpdidl:Contents ref="#mp(/byte(20000,200000))"/>
        </ipmpdidl:ProtectedAsset>
    </Resource>
</Component>
    <Item id="AudioStream1">
        <Descriptor>
            <Statement mimeType="text/xml">
                <dii:Identifier>urn:mpegRA:mpeg21:dii:isrc:US-ZO3-99-32476</dii:Identifier>
                <!-- ISRC identifying the sound recording -->
            </Statement>
        </Descriptor>
        <Descriptor>
            <Statement mimeType="text/xml">
                <dii:RelatedIdentifier>urn:mpegRA:mpeg21:dii:iswc:T-034.524.680-1
</dii:RelatedIdentifier>
                <!-- ISWC identifying the underlying musical work -->
            </Statement>
        </Descriptor>
        <Descriptor>
            <Statement mimeType="text/xml">
                <didl-msx:Metadata>
                    <!-- Metadata related to this Content Item is Governed now -->
                    <ipmpdidl:Info>
                        <ipmpinfo:IPMPInfoDescriptor/>
                    </ipmpdidl:Info>
                    <ipmpdidl:Contents>01234567890ABCDEF</ipmpdidl:Contents>
                    <!-- Insert the Governed - obfuscated metadata in element below -->
                </didl-msx:Metadata>
            </Statement>
        </Descriptor>
        <Component>
            <Resource ref="110xxxxx" mimeType="audio/mpeg"/>
            <!-- Audio streams are identified by a stream ID like the one above -->
        </Component>
    </Item>
    <Item id="VideoStream1">
        <Descriptor>
            <Statement mimeType="text/xml">
                <dii:Identifier>urn:mpegRA:mpeg21:dii:isan:006A-15FA-002B-B012-A</dii:Identifier>
            </Statement>
        </Descriptor>
```

```
            <Descriptor>
                <Statement mimeType="text/xml">
                    <didl-msx:Metadata>
                        <didl-msx:StructuredData ref="urn:mpeg:mpeg7:schema:2001">
                            <!-- MPEG-7 SMP metadata describing the movie-->
                        </didl-msx:StructuredData>
                    </didl-msx:Metadata>
                </Statement>
            </Descriptor>
            <Component>
                <Resource ref="1110xxxx" mimeType="video/mpeg"/>
                <!-- Video streams are identified by a stream ID like the one above -->
            </Component>
        </Item>
    </Item>
</DIDL>
```

H.2.2 License

A rights issuer sends a license that allows a principal to copy the specified broadcast news after it is stored under the following conditions

a) Only one generation copy is allowed (Copy-Once)
b) Once copied, the copy operation cannot be repeated (Copy-No-More)

The following example shows a license containing a copy-once rights. This broadcast program is allowed to be copied once as it has the bpx:governedCopy condition.

```
<?xml version="1.0" encoding="UTF-8"?>
<license xmlns="urn:mpeg:mpeg21:2003:01-REL-R-NS" xmlns:mx="urn:mpeg:mpeg21:2003:01-REL-MX-NS"
xmlns:dacx="urn:mpeg:mpeg21:2006:01-REL-DACX-NS" xmlns:dsig="http://www.w3.org/2000/09/xmldsig#"
xmlns:xenc="http://www.w3.org/2001/04/xmlenc#" xmlns:r="urn:mpeg:mpeg21:2003:01-REL-R-NS"
xmlns:sx="urn:mpeg:mpeg21:2003:01-REL-SX-NS" xmlns:bpx="urn:mpeg:mpeg21:2005:01-REL-BPX-NS"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" sx:profileCompliance="dmp-IDP2-rel-1.0"
xsi:schemaLocation="urn:mpeg:mpeg21:2006:01-REL-DACX-NS rel-dacx-v1.xsd">
    <grant>
        <bpx:identityHolder licensePartId="domainA">
            <bpx:idSystem>urn:mpeg:mpeg21:2006-01-REL-DACX-NS:DM-00001000</bpx:idSystem>
            <bpx:idValue>BSI:2232111123</bpx:idValue>
        </bpx:identityHolder>
        <mx:play/>
        <digitalResource licensePartId="news">
            <r:nonSecureIndirect URI="urn:broadcast:news:2005 07 10-12H-00M"/>
        </digitalResource>
    </grant>
    <r:grant>
        <bpx:identityHolder licensePartIdRef="domainA"/>
        <bpx:governedCopy governanceRule="acme:CopyOnce"/>
        <r:digitalResource licensePartIdRef="news"/>
    </r:grant>
    <r:issuer>
        <keyHolder>
            <info>
                <dsig:KeyName>Rights Issuer Public Key Name</dsig:KeyName>
            </info>
        </keyHolder>
    </r:issuer>
</license>
```

H.2.3 IPMP Components, etc.

The following example shows an IPMPGeneralInfoDescriptor describing a ToolPack composed by a Tool Agent and a Tool Group.

```
<ipmpinfo:IPMPGeneralInfoDescriptor>
    <ipmpinfo:ToolList>
        <ipmpinfo:ToolDescription localID="TPABCDEF9">
            <ipmpinfo:IPMPToolID>urn:foo:ToolPack:ToolID:ABCDEF9</ipmpinfo:IPMPToolID>
            <ipmpinfo:Inline>
                <ipmpinfo-msx:ToolBody>
                    <ipmpinfo-msx:ToolPack>
                        <ipmpinfo-msx:ToolBodyID>urn:acme:ToolPack:ToolBodyID:ABCDEF9</ipmpinfo-msx:ToolBodyID>
                            <ipmpinfo-msx:DeviceInformation>
                                <mpeg4ipmp:OperatingSystem>
                                    <mpeg4ipmp:Vendor>Red Hat</mpeg4ipmp:Vendor>
                                    <mpeg4ipmp:Model>Enterprise</mpeg4ipmp:Model>
                                    <mpeg4ipmp:Version>9.0</mpeg4ipmp:Version>
                                </mpeg4ipmp:OperatingSystem>
                            </ipmpinfo-msx:DeviceInformation>
                            <ipmpinfo-msx:ToolPackageType>application/zip</ipmpinfo-msx:ToolPackageType>
                            <ipmpinfo-msx:ToolAgent>
                                <ipmpinfo-msx:ToolAgentID>
                                    urn:acme:ToolPack:ToolID:ABCDEF9:ToolAgentID:001
                                </ipmpinfo-msx:ToolAgentID>
                                <!-- Include the code implementing the DRM Tool in the element below -->
                                <ipmpinfo-msx:ToolAgentCode>AB67543EF5554CD0</ipmpinfo-msx:ToolAgentCode>
                            </ipmpinfo-msx:ToolAgent>
                    </ipmpinfo-msx:ToolPack>
                </ipmpinfo-msx:ToolBody>
            </ipmpinfo:Inline>
        </ipmpinfo:ToolDescription>
    </ipmpinfo:ToolList>
</ipmpinfo:IPMPGeneralInfoDescriptor>
```

The following example shows the declaration of a Resource protected by the IPMP Tool (ToolPack) declared in the figure above.

```
<Resource mimeType="application/mp21-ipmp">
    <ipmpdidl:ProtectedAsset mimeType="video/MP2P">
        <ipmpdidl:Identifier>urn:mpegRA:mpeg21:dii:isan:006A-15FA-002B-C95F-B</ipmpdidl:Identifier>
            <ipmpdidl:Info>
                <ipmpinfo:IPMPInfoDescriptor>
                    <ipmpinfo:Tool localIDRef="TPABCDEF9"/>
                        <ipmpinfo:InitializationSettings>
                            <ipmpinfo:InitializationData>
                            <!-- IPMP Message for Tool/ToolPack Initialization -->
                            </ipmpinfo:InitializationData>
                        </ipmpinfo:InitializationSettings>
                    <ipmpinfo:RightsDescriptor>
                    <!-- Here is Rights Information related to IPMP Tools -->
                    </ipmpinfo:RightsDescriptor>
                </ipmpinfo:Tool>
                <ipmpinfo:RightsDescriptor>
                    <ipmpinfo:License>
                        <r:license licenseId="012345"/>...</r:license>
                    </ipmpinfo:License>
                </ipmpinfo:RightsDescriptor>
            </ipmpinfo:IPMPInfoDescriptor>
        </ipmpdidl:Info>
        <ipmpdidl:Contents ref=" #mp(/byte(15000, 30000))"/>
    </ipmpdidl:ProtectedAsset>
</Resource>
```

Annex I
(informative)

An Example of Media Streaming Application Format:
Streaming of interactive video, metadata, multimedia objects and presentation information

In this example a value chain is created with the goal to enable those who create good long tail videos to get a reward for their work, if this is valid. In this value chain creators are given the means to release their digital video content packaged in a file with five technologies, viz.:

1. A REL licence expressing the intentions of a Creative Commons (CC) licence

2. An event report request instructing a Media Streaming Player to send information about a defined set of actions that users can make on video content such as play, pause, stop, store, share etc.

3. A rich set of metadata describing what the video is about

4. Presentation information on how subtitles, menus, buttons etc. should be presented

5. Information to make the package immediately streamable

Depending on the type of CC licence, anybody can use the content according to licence terms. A service provider could find the video on the internet, e.g. by exploiting the rich set of metadata and then provide services, e.g. advertisement, based on it. Creators would know how many times their content is used and could have common metrics with the service provider to share revenues according to a variety of business models.

The Figure below represents a possible implementation of a value chain.
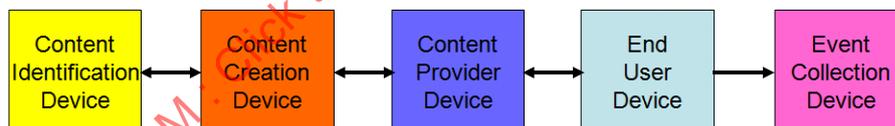
This is a possible walkthrough

1. Creator uses a Content Creation Device to make a Digital Item containing Video, Metadata, Licence (Creative Commons), Event Report Request and Presentation of Digital Item information

2. Creator gets identifiers for resources and the Digital Item from the Content Identification Device

3. Creator uploads the Digital Item to the Content Provider Device

4. Depending on the type of licence the Content Provider Device can add LASeR objects at appropriate time instants

5. An end-user browses the Content Provider Device and selects a video

6. The Content Provider Device streams the video and associated information

7. Every time the end user performs an action listed in the Event Report Request an Event Report is generated and sent to the Event Collection Device

8. A User with appropriate rights can access the Event Collection Device and get statistical information on the usage of content streamed by the Content Provider Device

Annex J
(informative)

An Example of Media Streaming Application Format:
IPTV Marketplace (IPTV-MP)

J.1 Scenario description

The scenario assumes that an IPTV marketplace (IPTV-MP) populated by the Users and Service Providers (SP) listed below are hosted by an ICT platform:

Users	Actions
Creators	Entrust their videos to Syndicators
	Browse EventMonitors' statistics of events related to their videos
Syndicators	Acquire rights to post Creators' videos to WebTVs
	Post videos to WebTVs
WebTVs	Acquire rights from Syndicators to distribute videos to End Users
	Post videos to End Users
End Users	Browse WebTVs' web sites
	Watch videos in pay-per-view (PPV) mode
	Send Event Reports to EventMonitors
EventMonitors	Receive Event Reports
	Makes event report statistics available to Creators
	Handle transactions between FWD Users
WebBanks	Creators pay Syndicators for posting their videos to WebTVs
	End Users pay WebTVs as per licence issued by WebTVs to End Users
	WebTVs pay Syndicators as per licence issued by Syndicators to WebTVs
	Syndicators pay Creators as per licence issued by Syndicators on behalf of Creators

Figure J.1 depicts the use case scenario where it is assumed that the IPTV-MP implementation is based on the MPEG Extensible Middleware (MXM) standard. IPTV-MP Users and Service Providers access the IPTV-MP services implemented as MXM Engines via the MXM API.
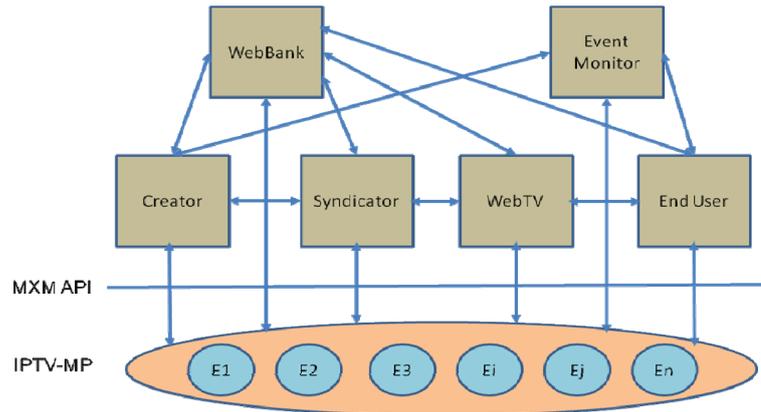
Figure J.1 — IPTV-MP implemented using the MXM standard

J.2 Terms and definitions

For an easier reading of the walkthrough the following terms and definitions will be used.

Table J.1 — Terms and acronyms used in walkthrough

Acronym	Definition
DI(Cre)	Digital Item made by Creator using the Syndicator's Content Creation application
Licence(Syn)	Licence made by Creator using the Syndicator's Content Creation application
DI(Syn)	Digital Item made by Syndicator for posting to WebTVs
TLicence(Wtv)	Licence template made by Syndicator for posting to WebTVs
DI(Wtv)	Digital Item made by Syndicator for a specific WebTV
Licence(Wtv)	Licence made by Syndicator for a specific WebTV
DI(End)	Digital Item made by WebTV for End User
TLicence(End)	Licence template made by WebTV for End Users
Licence(End)	Licence made by WebTV for a specific End User
DK	Domain key for the domain of WebTV subscribers
KS	Key Sequence generated by Syndicator to encrypt Resource
MK	Master key
PubK	WebTV public key
PriK	WebTV private key

J.3 A walkthrough

Before anything else Creator, Syndicator, WebTV and End User establish a business relationship.

Table J.2 — Initial walkthrough of Creator, WebTV and End User

	By	To	Action
1	Creator	Syndicator	Agrees to pay fixed amount to Syndicator for videos posted to WebTVs
2	Syndicator	WebBank	Issues order to cash
3	WebBank	Creator	Forwards order to cash
4	Creator	WebBank	Issues open order to pay Syndicator
5	WebTV	Syndicator	Agrees to pay fixed amount to Syndicator for every video played by WebTV subscribers
6		Syndicator	Opens Property Possessor application provided by Syndicator to identify classes of WebTV subscribers
7	Syndicator		Creates Property Possessor Licence
8		WebTV	Delivers Property Possessor Licence
9	WebTV		Generates Domain Key (DK)
10	End User	WebTV	Subscribes
11		WebTV	Opens Property Possessor application provided by WebTV to identify subscriber class
12	WebTV		Creates Property Possessor Licence
13		End User	Delivers Property Possessor Licence

The steps in Table J.2 are depicted in the sequence diagram of Figure J.2.

Figure J.2 — Sequence diagram of initial walkthrough of Creator, WebTV and End User

Now it is possible to have the following end-to-end walkthrough.

Table J.3 — Regular walkthrough

	By	To	Action
1	Creator	Syndicator	Opens Content Creation application provided by Syndicator
2		Syndicator	*Begin "Make Digital Item for Syndicator (DI(Cre))"*
			Identifies Resource

			Describes Resource
			Makes licence to Syndicator (Licence(Syn)) with 1. Grant to re-issue Licence 2. Conditions for re-issuing 3. Conditions of remuneration (fixed fee per play)
			Adds Event Report Request to DI(Cre)
			Identifies DI(Cre)
		Syndicator	*End "Make Digital Item for Syndicator (DI(Cre))"*
3	Syndicator	WebBank	Issues order to cash
4	WebBank		Pays as requested
5		Syndicator	Notifies payment
6	Syndicator		Stores DI(Cre) including Resource
			Begin "Make Syndicator's Digital Item DI(Syn))"
			Generates Key Sequence (KS) to encrypt Creator's Resource
			Encrypts Resource using KS
			Identifies encrypted Resource
			Adapts Resource description in DI(Cre) to DI(Syn)
			Makes licence template TLicence(Wtv) with 1. Encrypted Grant from Creator 2. Grant to re-issue Licence 3. Conditions for re-issuing 4. Conditions of remuneration (fixed fee per play)
			End "Make Digital Item for Syndicator (DI(Syn))"
			Stores DI(Syn)
			Posts DI(Syn)
7	WebTV	Syndicator	Visits web site
		Syndicator	Accesses DI(Syn) skeleton
8	WebTV		Presents DI(Syn) skeleton
		Syndicator	Selects DI(Syn)
9	Syndicator		*Begin "Make WebTV's Digital Item DI(Wtv)"*
			Generates Master Key (MK)
			Encrypts KS with MK

			Encrypts MK with WebTV's Public Key (PubK)
			Creates Licence(Wtv)
			Replace template Licence with Licence(Wtv)
			Identifies DI(Wtv)
			End "Make WebTV's Digital Item DI(Wtv)"
10	WebTV	Syndicator	Agrees to DI(Wtv)
11	Syndicator		Stores DI(Wtv)
12	WebTV	Syndicator	Accesses DI(Wtv)
13			Stores DI(Wtv)
			Decrypts MK in DI(Wtv) with Private Key (PriK)
			Encrypts MK with Domain Key (DK)
			Begin "Make DI(End)"
			Adapts Resource description in the DI(Wtv) to DI(End)
			Creates template licence for End User TLicence (End) with 1. Encrypted Grant from Syndicator 2. Grant to play 3. Property Possessor reference 4. Remuneration (fixed fee per play) 5. Adds encrypted MK to licence
			Identifies DI(End)
			End "Make DI(End)"
			Posts DI(End)
14	End User	WebTV	Accesses DI(End) skeleton
15			Presents DI(End) skeleton
16		WebTV	Selects DI(End)
17	WebTV	WebBank	Issues order to cash
18	WebBank	End User	Forwards order to cash
19	End User	WebBank	Issues order to pay
20	WebBank		Pays
		WebTV	Notifies execution of payment
21	WebTV	WebBank	Issues order to pay

22	WebBank		Pays Syndicator
23		Syndicator	Notifies execution of payment
24	Syndicator	WebBank	Issues order to pay
25	WebBank		Pays Creator
26		Creator	Notifies execution of payment
27	WebTV		Updates TLicence(End) with End User's data → Licence(End)
28		End User	Delivers DI(End)
29	End User		Decrypts MK with DK
			Decrypts KS with MK
			Decrypts encrypted Resource with KS
30		EventMonitor	Generates Event Report
31	EventMonitor		Receives End User's Event Report
			Stores Event Report
32	Creator	EventMonitor	Searches Event statistics

The steps in Table J.3 are depicted in the sequence diagram of Figure J.3.

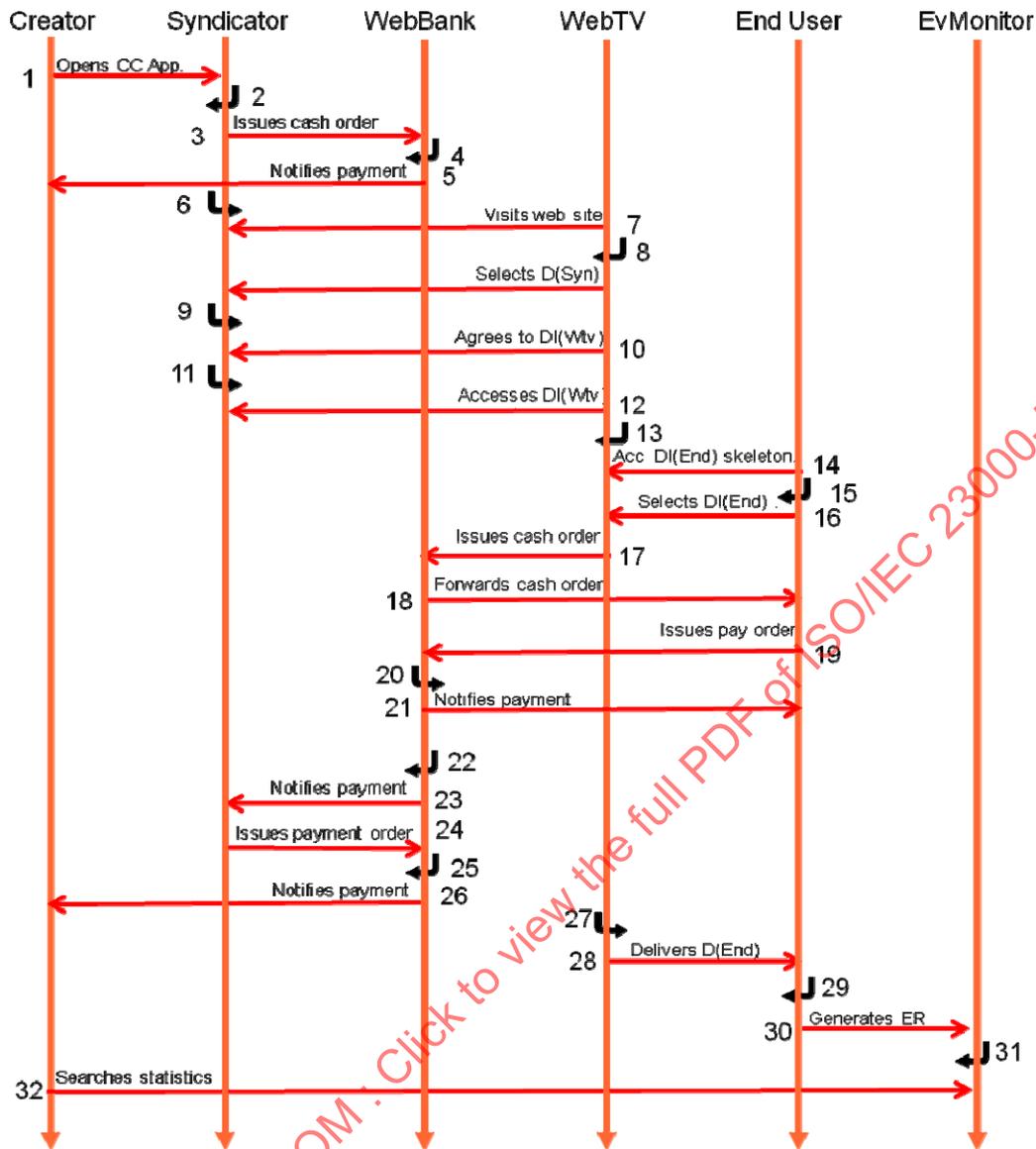**Figure J.3 — Sequence diagram of regular walkthrough**

J.4 Data type examples

J.4.1 Digital Items

J.4.1.1 Creator's DI

```
<?xml version="1.0" encoding="UTF-8" standalone="yes"?>
<ns16:DIDL xmlns:ns2="urn:mpeg:mpeg21:2004:01-IPMPINFO-NS"
xmlns:ns3="http://www.w3.org/2000/09/xmldsig#"
xmlns:ns4="urn:mpeg:maf:Schema:mediastreaming:IPMPINFOextensions:2007"
xmlns:ns5="urn:mpeg:mpeg4:IPMPSchema:2002" xmlns:ns6="urn:mpeg:mpegB:schema:IPMP-XML-MESSAGES:2007"
xmlns:ns7="urn:mpeg:mpeg21:2002:01-DII-NS" xmlns:ns8="http://www.w3.org/2001/04/xmlenc#"
xmlns:ns9="urn:mpeg:mpeg21:2003:01-REL-R-NS" xmlns:ns10="urn:mpeg:mpeg21:2003:01-REL-SX-NS"
xmlns:ns11="urn:mpeg:mpeg21:2005:01-REL-M1X-NS" xmlns:ns12="urn:mpeg:mpeg21:2003:01-REL-MX-NS"
xmlns:ns13="urn:mpeg:mpeg21:2006:01-REL-M2X-NS" xmlns:ns14="urn:mpeg:mpeg21:2006:01-REL-M3X-NS"
xmlns:ns15="urn:iptv-mp:2009:01-REL-IPTV-MP" xmlns:ns16="urn:mpeg:mpeg21:2006:07-DIDL-NS"
xmlns:ns17="urn:mpeg:mpeg21:2002:02-DIDMODEL-NS"
xmlns:ns18="urn:mpeg:maf:schema:mediastreaming:DIDextensions" xmlns:ns19="urn:mpeg:mpeg21:2005:01-
ERL-NS" xmlns:ns20="urn:mpeg:mpeg21:2004:01-IPMPDIDL-NS" xmlns:ns21="urn:mpeg:mpeg7:smp:schema:2001"
```

```
xmlns:ns22="urn:dmp:idp:represent:PaymentProtocol:2008" xmlns:ns23="urn:mpeg:mpeg-
m:schema:baseprotocol:2009">
    <ns16:Item id="A0">
        <ns16:Descriptor>
            <ns16:Statement mimeType="text/xml">
                <ns7:Identifier>urn:cedeo:iptv-mp:content:dfa32726-17e9-4e55-be72-
579b3e2f3c9c</ns7:Identifier>
            </ns16:Statement>
        </ns16:Descriptor>
        <ns16:Descriptor>
            <ns16:Statement mimeType="text/xml">
                <ns18:Metadata>
                    <ns18:StructuredData ref="urn:mpeg:mpeg7:smp:schema:2001">
                        <ns21:Mpeg7>
                            <ns21:Description xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:type="ns21:CreationDescriptionType">
<ns21:CreationInformation>
    <ns21:Creation>
        <ns21:Title xml:lang="en">The BIG Lebowsky</ns21:Title>
        <ns21:Abstract>
            <ns21:FreeTextAnnotation xml:lang="en">Her life was in their hands. Now her toe is in the
mail.</ns21:FreeTextAnnotation>
        </ns21:Abstract>
        <ns21:Creator>
            <ns21:Role href="urn:mpeg:mpeg7:cs:RoleCS:2001:ACTOR"/>
            <ns21:Agent xsi:type="ns21:PersonType">
                <ns21:Name>
                    <ns21:GivenName>Jeff</ns21:GivenName>
                    <ns21:FamilyName>Bridges</ns21:FamilyName>
                </ns21:Name>
            </ns21:Agent>
        </ns21:Creator>
        <ns21:CreationCoordinates>
            <ns21:Date>
                <ns21:TimePoint>1998-05-01T00:00:00</ns21:TimePoint>
            </ns21:Date>
        </ns21:CreationCoordinates>
    </ns21:Creation>
    <ns21:Classification>
        <ns21:Genre href="urn:mpeg:mpeg7:cs:GenreCS:2001:2.1.2">
            <ns21:Name preferred="true" xml:lang="en">Comedy</ns21:Name>
        </ns21:Genre>
    </ns21:Classification>
</ns21:CreationInformation>
                            </ns21:Description>
                        </ns21:Mpeg7>
                    </ns18:StructuredData>
                </ns18:Metadata>
            </ns16:Statement>
        </ns16:Descriptor>
        <ns16:Item id="B0">
            <ns16:Descriptor>
                <ns16:Statement mimeType="text/xml">
                    <ns7:Identifier>urn:cedeo:iptv-mp:contentelement:671ab218-8449-4f8e-a1be-
a8027a108b06</ns7:Identifier>
                </ns16:Statement>
            </ns16:Descriptor>
            <ns16:Descriptor>
                <ns16:Statement mimeType="text/xml">
                    <ns18:Metadata>
                        <ns18:StructuredData ref="urn:mpeg:mpeg7:smp:schema:2001">
                            <ns21:Mpeg7>
<ns21:Description xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:type="ns21:CreationDescriptionType">
    <ns21:CreationInformation>
        <ns21:Creation>
            <ns21:Title xml:lang="en">The BIG Lebowsky</ns21:Title>
            <ns21:Abstract>
                <ns21:FreeTextAnnotation xml:lang="en">Her life was in their hands. Now her toe is in
the mail.</ns21:FreeTextAnnotation>
            </ns21:Abstract>
            <ns21:Creator>
                <ns21:Role href="urn:mpeg:mpeg7:cs:RoleCS:2001:ACTOR"/>
                <ns21:Agent xsi:type="ns21:PersonType">
                    <ns21:Name>
                        <ns21:GivenName>Jeff</ns21:GivenName>
```

```
                    <ns21:FamilyName>Bridges</ns21:FamilyName>
                </ns21:Name>
            </ns21:Agent>
        </ns21:Creator>
        <ns21:CreationCoordinates>
            <ns21:Date>
                <ns21:TimePoint>1998-05-01T00:00:00</ns21:TimePoint>
            </ns21:Date>
        </ns21:CreationCoordinates>
    </ns21:Creation>
    <ns21:Classification>
        <ns21:Genre href="urn:mpeg:mpeg7:cs:GenreCS:2001:2.1.2">
            <ns21:Name preferred="true" xml:lang="en">Comedy</ns21:Name>
        </ns21:Genre>
    </ns21:Classification>
</ns21:CreationInformation>
</ns21:Description>
                            </ns21:Mpeg7>
                        </ns18:StructuredData>
                    </ns18:Metadata>
                </ns16:Statement>
            </ns16:Descriptor>
            <ns16:Descriptor>
                <ns16:Statement mimeType="text/xml">
                    <ns19:ERR>
                        <ns19:ERRDescriptor>
                            <ns19:LifeTime>
<ns19:StartTime>2004-07-01T00:00:00</ns19:StartTime>
<ns19:EndTime>2004-07-08T00:00:00</ns19:EndTime>
                            </ns19:LifeTime>
                            <ns19:Modification>
<ns19:PeerId>GUID:1AC5-4527-A864-3EA2</ns19:PeerId>
<ns19:UserId>CISAC:IPI:P-1435 6382</ns19:UserId>
<ns19:Time>2004-06-30T18:00:00</ns19:Time>
<ns19:Description>Creation Reference</ns19:Description>
                            </ns19:Modification>
                            <ns19:Priority>3</ns19:Priority>
                        </ns19:ERRDescriptor>
                        <ns19:ERSpecification>
                            <ns7:Identifier>urn:mpegRA:mpeg21:dii:cid:1702</ns7:Identifier>
                            <ns19:ERDescription>This is a description</ns19:ERDescription>
                            <ns19:ERPayloadSpecification>
<ns19:ERIdentifier baseId="true">urn:isbn:0-395-36341-1</ns19:ERIdentifier>
<ns19:PeerId xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns:xs="http://www.w3.org/2001/XMLSchema" xsi:type="xs:string"></ns19:PeerId>
<ns19:UserId xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns:xs="http://www.w3.org/2001/XMLSchema" xsi:type="xs:string"></ns19:UserId>
<ns19:Time xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns:xs="http://www.w3.org/2001/XMLSchema" xsi:type="xs:string"></ns19:Time>
<ns19:Location xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns:xs="http://www.w3.org/2001/XMLSchema" xsi:type="xs:string"></ns19:Location>
<ns19:DIOperation xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns:xs="http://www.w3.org/2001/XMLSchema" xsi:type="xs:string"></ns19:DIOperation>
<ns19:DomainData syntax="xsd:String" semantics="acme:PhoneName" reportTag="Name"/>
<ns19:DomainData value="155" syntax="xsd:Integer" semantics="AcmeFilm:Length"/>
<ns19:DIMetadata>
    <ns19:DISelection>
        <ns19:DISelectionViaDII xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns:xs="http://www.w3.org/2001/XMLSchema" xsi:type="xs:string">urn:mpegra:mpeg21:dii:isrc:BE-R45-
98-03948576</ns19:DISelectionViaDII>
    </ns19:DISelection>
    <ns19:DIMetadataElement tagName="Title"/>
    <ns19:DIMetadataElement tagName="Artist"/>
    <ns19:DIMetadataElement tagName="ISWC"/>
</ns19:DIMetadata>
                            </ns19:ERPayloadSpecification>
                            <ns19:ERFormatSpecification>
<ns19:Ref>http://www.acme.org/schemas/phone.xsd</ns19:Ref>
<ns19:XMLschema></ns19:XMLschema>
<ns19:MimeType></ns19:MimeType>
                            </ns19:ERFormatSpecification>
                            <ns19:ERDeliverySpecification>
<ns19:Recipient>
    <ns19:PeerId>urn:MAC:00-08-E3-AE-1E-62</ns19:PeerId>
    <ns19:UserId>urn:mpegra:mpeg21:IPI:0012395868374</ns19:UserId>
</ns19:Recipient>
```

```
<ns19:DeliveryTime>
    <ns19:SpecificTime>
        <ns19:AfterOn>2005-07-01T00:00:00</ns19:AfterOn>
        <ns19:BeforeOn>2005-09-08T00:00:00</ns19:BeforeOn>
    </ns19:SpecificTime>
</ns19:DeliveryTime>
<ns19:DITransportService>
    <ns9:serviceReference>
        <ns9:serviceDescription xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:type="ns11:ServiceLocation">
            <ns11:url>http://localhost:8080/ReportCollectorDevice</ns11:url>
        </ns9:serviceDescription>
    </ns9:serviceReference>
</ns19:DITransportService>
                            </ns19:ERDeliverySpecification>
                            <ns19:EmbeddedERR>
<ns19:ERRReference>mpeg:mpeg21:dii:ERRID:010</ns19:ERRReference>
                            </ns19:EmbeddedERR>
                        </ns19:ERSpecification>
                        <ns19:EventConditionDescriptor>
                            <ns19:TimeCondition>
<ns19:TimeEvent>
    <ns19:SpecificTime>
        <ns19:AfterOn>2005-07-01T00:00:00</ns19:AfterOn>
        <ns19:BeforeOn>2005-09-08T00:00:00</ns19:BeforeOn>
    </ns19:SpecificTime>
</ns19:TimeEvent>
                            </ns19:TimeCondition>
                            <ns19:Operator1 name="AND"/>
                            <ns19:PeerCondition>
<ns19:PeerEvent name="=" location="infix">
    <ns24:PlaceType xmlns:ns24="urn:mpeg:mpeg7:schema:2001">
        <Region>kr</Region>
    </ns24:PlaceType>
</ns19:PeerEvent>
                            </ns19:PeerCondition>
                            <ns19:Operator1 name="OR"/>
                            <ns19:DIOperationCondition>
<ns19:DIOperationEvent>
    <ns19:Operation>Play</ns19:Operation>
    <ns19:DII>mpeg:mpeg21:dii:ID:ACME-010</ns19:DII>
</ns19:DIOperationEvent>
                            </ns19:DIOperationCondition>
                        </ns19:EventConditionDescriptor>
                    </ns19:ERR>
                </ns16:Statement>
            </ns16:Descriptor>
            <ns16:Component>
                <ns16:Resource mimeType="application/mp21-ipmp">
                    <ns20:ProtectedAsset mimeType="video/avi">
                        <ns20:Identifier>urn:cedeo:iptv-mp:contentelement:671ab218-8449-4f8e-a1be-
a8027a108b06</ns20:Identifier>
                        <ns20:Info>
                            <ns2:IPMPInfoDescriptor>
<ns2:RightsDescriptor>
    <ns2:License>
        <ns9:license licenseId="0516e01a-fe17-4672-abf6-7224108d8c49">
            <ns9:inventory>
                <ns11:protectedResource licensePartId="d2acc0b6-d0c2-4fae-9143-334b42850983">
                    <ns9:digitalResource>
                        <ns9:nonSecureIndirect URI="urn:cedeo:iptv-mp:contentelement:671ab218-8449-
4f8e-a1be-a8027a108b06"/>
                    </ns9:digitalResource>
                </ns11:protectedResource>
            </ns9:inventory>
            <ns9:grant>
                <ns9:keyHolder>
                    <ns9:info>
                        <ns3:KeyName>Syn1</ns3:KeyName>
                        <ns3:KeyValue>
                            <ns3:RSAKeyValue>
<ns3:Modulus>AIic2gVVtjL4NUMF80Zxr7LoaujdLJSyFO9nEVaUKAVkv/RjvTxhgQhFelyUG3QVLh8ozLuj8uUnyG3V9FogDypa
jUu0+X3PU+IBZw+tbv0J6l5A5UBuSBKwdd8HZoCXZcYpfDBTU7RFPYxFEXoxngRiE0jDe6QMEkgr+b2B62xJ</ns3:Modulus>
<ns3:Exponent>AQAB</ns3:Exponent>
                            </ns3:RSAKeyValue>
                        </ns3:KeyValue>
```

```
                                </ns9:info>
                            </ns9:keyHolder>
                        <ns12:play/>
                        <ns11:protectedResource licensePartIdRef="d2acc0b6-d0c2-4fae-9143-334b42850983"/>
                    </ns9:grant>
                    <ns9:grant>
                        <ns9:keyHolder>
                            <ns9:info>
                                <ns3:KeyName>Syn1</ns3:KeyName>
                                <ns3:KeyValue>
                                    <ns3:RSAKeyValue>
<ns3:Modulus>AIic2gVVtjL4NUMF80Zxr7LoaujdLJSyFO9nEVaUKAVkv/RjvTxhgQhFelyUG3QVLh8ozLuj8uUnyG3V9FogDypa
jUu0+X3PU+IBZw+tbv0J6l5A5UBuSBKwdd8HZoCXZcYpfDBTU7RFPYxFEXoxngRiE0jDe6QMEkgr+b2B62xJ</ns3:Modulus>
<ns3:Exponent>AQAB</ns3:Exponent>
                                    </ns3:RSAKeyValue>
                                </ns3:KeyValue>
                            </ns9:info>
                        </ns9:keyHolder>
                        <ns11:governedCopy/>
                        <ns11:protectedResource licensePartIdRef="d2acc0b6-d0c2-4fae-9143-334b42850983"/>
                    </ns9:grant>
                    <ns9:grant>
                        <ns9:forAll varName="61e4e8ac-8501-4071-b072-4d68f19d6b16">
                            <ns9:propertyPossessor>
                                <ns10:propertyUri definition="Syn1:WebTV"/>
                                <ns9:trustedRootIssuers>
                                    <ns9:keyHolder>
<ns9:info>
    <ns3:KeyName>Syn1</ns3:KeyName>
    <ns3:KeyValue>
        <ns3:RSAKeyValue>

<ns3:Modulus>AIic2gVVtjL4NUMF80Zxr7LoaujdLJSyFO9nEVaUKAVkv/RjvTxhgQhFelyUG3QVLh8ozLuj8uUnyG3V9FogDypa
jUu0+X3PU+IBZw+tbv0J6l5A5UBuSBKwdd8HZoCXZcYpfDBTU7RFPYxFEXoxngRiE0jDe6QMEkgr+b2B62xJ</ns3:Modulus>
            <ns3:Exponent>AQAB</ns3:Exponent>
        </ns3:RSAKeyValue>
    </ns3:KeyValue>
</ns9:info>
                                    </ns9:keyHolder>
                                </ns9:trustedRootIssuers>
                            </ns9:propertyPossessor>
                        </ns9:forAll>
                        <ns9:forAll varName="b334be00-8f52-47dc-af89-c6eea49bf7db">
                            <ns9:propertyPossessor>
                                <ns10:propertyUri definition="Syn1:WebTV:USERS"/>
                                <ns9:trustedRootIssuers>
                                    <ns9:keyHolder>
<ns9:info>
    <ns3:KeyName>Syn1</ns3:KeyName>
    <ns3:KeyValue>
        <ns3:RSAKeyValue>

<ns3:Modulus>AIic2gVVtjL4NUMF80Zxr7LoaujdLJSyFO9nEVaUKAVkv/RjvTxhgQhFelyUG3QVLh8ozLuj8uUnyG3V9FogDypa
jUu0+X3PU+IBZw+tbv0J6l5A5UBuSBKwdd8HZoCXZcYpfDBTU7RFPYxFEXoxngRiE0jDe6QMEkgr+b2B62xJ</ns3:Modulus>
            <ns3:Exponent>AQAB</ns3:Exponent>
        </ns3:RSAKeyValue>
    </ns3:KeyValue>
</ns9:info>
                                    </ns9:keyHolder>
                                </ns9:trustedRootIssuers>
                            </ns9:propertyPossessor>
                        </ns9:forAll>
                        <ns9:keyHolder>
                            <ns9:info>
                                <ns3:KeyName>Syn1</ns3:KeyName>
                                <ns3:KeyValue>
                                    <ns3:RSAKeyValue>
<ns3:Modulus>AIic2gVVtjL4NUMF80Zxr7LoaujdLJSyFO9nEVaUKAVkv/RjvTxhgQhFelyUG3QVLh8ozLuj8uUnyG3V9FogDypa
jUu0+X3PU+IBZw+tbv0J6l5A5UBuSBKwdd8HZoCXZcYpfDBTU7RFPYxFEXoxngRiE0jDe6QMEkgr+b2B62xJ</ns3:Modulus>
<ns3:Exponent>AQAB</ns3:Exponent>
                                    </ns3:RSAKeyValue>
                                </ns3:KeyValue>
                            </ns9:info>
                        </ns9:keyHolder>
                        <ns9:issue/>
                        <ns9:grantGroup>
```

```
                            <ns9:grant>
                                <ns9:principal varRef="61e4e8ac-8501-4071-b072-4d68f19d6b16"/>
                                <ns12:play/>
                                <ns11:protectedResource licensePartIdRef="d2acc0b6-d0c2-4fae-9143-
334b42850983"/>
                            </ns9:grant>
                            <ns9:grant>
                                <ns9:principal varRef="61e4e8ac-8501-4071-b072-4d68f19d6b16"/>
                                <ns11:governedCopy/>
                                <ns11:protectedResource licensePartIdRef="d2acc0b6-d0c2-4fae-9143-
334b42850983"/>
                            </ns9:grant>
                            <ns9:grant>
                                <ns9:principal varRef="61e4e8ac-8501-4071-b072-4d68f19d6b16"/>
                                <ns9:issue/>
                                <ns9:grant>
                                    <ns9:principal varRef="b334be06-8f52-47dc-af89-c6eea49bf7db"/>
                                    <ns12:play/>
                                    <ns11:protectedResource licensePartIdRef="d2acc0b6-d0c2-4fae-9143-
334b42850983"/>
                                    <ns10:feePerUse>
<ns10:rate>
    <ns10:amount>5.0</ns10:amount>
    <ns10:currency xmlns:iso="urn:mpeg:mpeg21:2003:01-REL-SX-NS:currency">iso:EUR</ns10:currency>
</ns10:rate>
<ns10:to>
    <ns22:ServiceInformation>
        <ns22:ServiceID>205</ns22:ServiceID>
        <ns22:ServiceURL>http://localhost:6996/services/</ns22:ServiceURL>
    </ns22:ServiceInformation>
</ns10:to>
                                    </ns10:feePerUse>
                                </ns9:grant>
                            </ns9:grant>
                        </ns9:grantGroup>
                    </ns9:grant>
                    <ns9:issuer>
                        <ns9:keyHolder>
                            <ns9:info>
                                <ns3:KeyName>dodo</ns3:KeyName>
                                <ns3:KeyValue>
                                    <ns3:RSAKeyValue>
<ns3:Modulus>AMNKbMTwxTtuzvug0Pona6IHltvB4auhAULLXtkpm3ICrve+KDOCTDKCOZqwZQExjQz7XN5znj9PBlVgk8VsnQS8
zz0mBK46Ka3TMPHDQX+GVXHb75cNPfkiF3dCaincdZ9JZkx9EagYQJINm8qnwb5T6jrGFrXf79XkyINN8BWb</ns3:Modulus>
<ns3:Exponent>AQAB</ns3:Exponent>
                                    </ns3:RSAKeyValue>
                                </ns3:KeyValue>
                            </ns9:info>
                        </ns9:keyHolder>
                    </ns9:issuer>
                </ns9:license>
            </ns2:License>
        </ns2:RightsDescriptor>
                                </ns2:IPMPInfoDescriptor>
                            </ns20:Info>
                            <ns20:Contents ref="prova.avi"/>
                        </ns20:ProtectedAsset>
                    </ns16:Resource>
                </ns16:Component>
            </ns16:Item>
        </ns16:Item>
</ns16:DIDL>
```

J.4.1.2 Syndicator's DI

```
<?xml version="1.0" encoding="UTF-8" standalone="yes"?>
<ns16:DIDL xmlns:ns2="urn:mpeg:mpeg21:2004:01-IPMPINFO-NS"
xmlns:ns3="http://www.w3.org/2000/09/xmldsig#"
xmlns:ns4="urn:mpeg:maf:Schema:mediastreaming:IPMPINFOextensions:2007"
xmlns:ns5="urn:mpeg:mpeg4:IPMPSchema:2002" xmlns:ns6="urn:mpeg:mpegB:schema:IPMP-XML-MESSAGES:2007"
xmlns:ns7="urn:mpeg:mpeg21:2002:01-DII-NS" xmlns:ns8="http://www.w3.org/2001/04/xmlenc#"
xmlns:ns9="urn:mpeg:mpeg21:2003:01-REL-R-NS" xmlns:ns10="urn:mpeg:mpeg21:2003:01-REL-SX-NS"
xmlns:ns11="urn:mpeg:mpeg21:2005:01-REL-M1X-NS" xmlns:ns12="urn:mpeg:mpeg21:2003:01-REL-MX-NS"
```

```
xmlns:ns13="urn:mpeg:mpeg21:2006:01-REL-M2X-NS" xmlns:ns14="urn:mpeg:mpeg21:2006:01-REL-M3X-NS"
xmlns:ns15="urn:iptv-mp:2009:01-REL-IPTV-MP" xmlns:ns16="urn:mpeg:mpeg21:2006:07-DIDL-NS"
xmlns:ns17="urn:mpeg:mpeg21:2002:02-DIDMODEL-NS"
xmlns:ns18="urn:mpeg:maf:schema:mediastreaming:DIDLextensions" xmlns:ns19="urn:mpeg:mpeg21:2005:01-
ERL-NS" xmlns:ns20="urn:mpeg:mpeg21:2004:01-IPMPDIDL-NS" xmlns:ns21="urn:mpeg:mpeg7:smp:schema:2001"
xmlns:ns22="urn:dmp:idp:represent:PaymentProtocol:2008" xmlns:ns23="urn:mpeg:mpeg-
m:schema:baseprotocol:2009">
    <ns16:Item id="A0">
        <ns16:Descriptor>
            <ns16:Statement mimeType="text/xml">
                <ns7:Identifier>urn:cedeo:iptv-mp:content:fe43dc7f-0bf0-4bcf-b2d5-
5c47123229be</ns7:Identifier>
            </ns16:Statement>
        </ns16:Descriptor>
        <ns16:Descriptor>
            <ns16:Statement mimeType="text/xml">
                <ns18:Metadata>
                    <ns18:StructuredData ref="urn:mpeg:mpeg7:smp:schema:2001">
                        <ns21:Mpeg7>
                            <ns21:Description xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:type="ns21:CreationDescriptionType">
<ns21:CreationInformation>
    <ns21:Creation>
        <ns21:Title xml:lang="en">The BIG Lebowsky</ns21:Title>
        <ns21:Abstract>
            <ns21:FreeTextAnnotation xml:lang="en">Her life was in their hands. Now her toe is in the
mail.</ns21:FreeTextAnnotation>
        </ns21:Abstract>
        <ns21:Creator>
            <ns21:Role href="urn:mpeg:mpeg7:cs:RoleCS:2001:ACTOR"/>
            <ns21:Agent xsi:type="ns21:PersonType">
                <ns21:Name>
                    <ns21:GivenName>Jeff</ns21:GivenName>
                    <ns21:FamilyName>Bridges</ns21:FamilyName>
                </ns21:Name>
            </ns21:Agent>
        </ns21:Creator>
        <ns21:CreationCoordinates>
            <ns21:Date>
                <ns21:TimePoint>1998-05-01T00:00:00</ns21:TimePoint>
            </ns21:Date>
        </ns21:CreationCoordinates>
    </ns21:Creation>
    <ns21:Classification>
        <ns21:Genre href="urn:mpeg:mpeg7:cs:GenreCS:2001:2.1.2">
            <ns21:Name preferred="true" xml:lang="en">Comedy</ns21:Name>
        </ns21:Genre>
    </ns21:Classification>
</ns21:CreationInformation>
                            </ns21:Description>
                        </ns21:Mpeg7>
                    </ns18:StructuredData>
                </ns18:Metadata>
            </ns16:Statement>
        </ns16:Descriptor>
        <ns16:Item id="B0">
            <ns16:Descriptor>
                <ns16:Statement mimeType="text/xml">
                    <ns7:Identifier>urn:cedeo:iptv-mp:contentelement:da89fd59-b5d5-49a3-859a-
ff5d90b84a2e</ns7:Identifier>
                </ns16:Statement>
            </ns16:Descriptor>
            <ns16:Descriptor>
                <ns16:Statement mimeType="text/xml">
                    <ns18:Metadata>
                        <ns18:StructuredData ref="urn:mpeg:mpeg7:smp:schema:2001">
                            <ns21:Mpeg7>
<ns21:Description xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:type="ns21:CreationDescriptionType">
    <ns21:CreationInformation>
        <ns21:Creation>
            <ns21:Title xml:lang="en">The BIG Lebowsky</ns21:Title>
            <ns21:Abstract>
                <ns21:FreeTextAnnotation xml:lang="en">Her life was in their hands. Now her toe is in
the mail.</ns21:FreeTextAnnotation>
            </ns21:Abstract>
```

```
                <ns21:Creator>
                    <ns21:Role href="urn:mpeg:mpeg7:cs:RoleCS:2001:ACTOR"/>
                    <ns21:Agent xsi:type="ns21:PersonType">
                        <ns21:Name>
                            <ns21:GivenName>Jeff</ns21:GivenName>
                            <ns21:FamilyName>Bridges</ns21:FamilyName>
                        </ns21:Name>
                    </ns21:Agent>
                </ns21:Creator>
                <ns21:CreationCoordinates>
                    <ns21:Date>
                        <ns21:TimePoint>1998-05-01T00:00:00</ns21:TimePoint>
                    </ns21:Date>
                </ns21:CreationCoordinates>
            </ns21:Creation>
            <ns21:Classification>
                <ns21:Genre href="urn:mpeg:mpeg7:cs:GenreCS:2001:2.1.2">
                    <ns21:Name preferred="true" xml:lang="en">Comedy</ns21:Name>
                </ns21:Genre>
            </ns21:Classification>
        </ns21:CreationInformation>
</ns21:Description>
                                </ns21:Mpeg7>
                            </ns18:StructuredData>
                        </ns18:Metadata>
                    </ns16:Statement>
                </ns16:Descriptor>
                <ns16:Descriptor>
                    <ns16:Statement mimeType="text/xml">
                        <ns19:ERR>
                            <ns19:ERRDescriptor>
                                <ns19:LifeTime>
<ns19:StartTime>2004-07-01T00:00:00</ns19:StartTime>
<ns19:EndTime>2004-07-08T00:00:00</ns19:EndTime>
                                </ns19:LifeTime>
                                <ns19:Modification>
<ns19:PeerId>GUID:1AC5-4527-A864-3EA2</ns19:PeerId>
<ns19:UserId>CISAC:IPI:P-1435 6382</ns19:UserId>
<ns19:Time>2004-06-30T18:00:00</ns19:Time>
<ns19:Description>Creation Reference</ns19:Description>
                                </ns19:Modification>
                                <ns19:Priority>3</ns19:Priority>
                            </ns19:ERRDescriptor>
                            <ns19:ERSpecification>
                                <ns7:Identifier>urn:mpegRA:mpeg21:dii:cid:1702</ns7:Identifier>
                                <ns19:ERDescription>This is a description</ns19:ERDescription>
                                <ns19:ERPayloadSpecification>
<ns19:ERIdentifier baseId="true">urn:isbn:0-395-36341-1</ns19:ERIdentifier>
<ns19:PeerId xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns:xs="http://www.w3.org/2001/XMLSchema" xsi:type="xs:string"></ns19:PeerId>
<ns19:UserId xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns:xs="http://www.w3.org/2001/XMLSchema" xsi:type="xs:string"></ns19:UserId>
<ns19:Time xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns:xs="http://www.w3.org/2001/XMLSchema" xsi:type="xs:string"></ns19:Time>
<ns19:Location xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns:xs="http://www.w3.org/2001/XMLSchema" xsi:type="xs:string"></ns19:Location>
<ns19:DIOperation xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns:xs="http://www.w3.org/2001/XMLSchema" xsi:type="xs:string"></ns19:DIOperation>
<ns19:DomainData syntax="xsd:String" semantics="acme:PhoneName" reportTag="Name"/>
<ns19:DomainData value="155" syntax="xsd:Integer" semantics="AcmeFilm:Length"/>
<ns19:DIMetadata>
    <ns19:DISelection>
        <ns19:DISelectionViaDII xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns:xs="http://www.w3.org/2001/XMLSchema" xsi:type="xs:string">urn:mpegra:mpeg21:dii:isrc:BE-R45-
98-03948576</ns19:DISelectionViaDII>
    </ns19:DISelection>
    <ns19:DIMetadataElement tagName="Title"/>
    <ns19:DIMetadataElement tagName="Artist"/>
    <ns19:DIMetadataElement tagName="ISWC"/>
</ns19:DIMetadata>
                                </ns19:ERPayloadSpecification>
                                <ns19:ERFormatSpecification>
<ns19:Ref>http://www.acme.org/schemas/phone.xsd</ns19:Ref>
<ns19:XMLschema></ns19:XMLschema>
<ns19:MimeType></ns19:MimeType>
                                </ns19:ERFormatSpecification>
```

```
                                <ns19:ERDeliverySpecification>
<ns19:Recipient>
    <ns19:PeerId>urn:MAC:00-08-E3-AE-1E-62</ns19:PeerId>
    <ns19:UserId>urn:mpegra:mpeg21:IPI:0012395868374</ns19:UserId>
</ns19:Recipient>
<ns19:DeliveryTime>
    <ns19:SpecificTime>
        <ns19:AfterOn>2005-07-01T00:00:00</ns19:AfterOn>
        <ns19:BeforeOn>2005-09-08T00:00:00</ns19:BeforeOn>
    </ns19:SpecificTime>
</ns19:DeliveryTime>
<ns19:DITransportService>
    <ns9:serviceReference>
        <ns9:serviceDescription xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:type="ns11:ServiceLocation">
            <ns11:url>http://localhost:8080/ReportCollectorDevice</ns11:url>
        </ns9:serviceDescription>
    </ns9:serviceReference>
</ns19:DITransportService>
                                </ns19:ERDeliverySpecification>
                                <ns19:EmbeddedERR>
<ns19:ERRReference>mpeg:mpeg21:dii:ERRID:010</ns19:ERRReference>
                                </ns19:EmbeddedERR>
                            </ns19:ERSpecification>
                            <ns19:EventConditionDescriptor>
                                <ns19:TimeCondition>
<ns19:TimeEvent>
    <ns19:SpecificTime>
        <ns19:AfterOn>2005-07-01T00:00:00</ns19:AfterOn>
        <ns19:BeforeOn>2005-09-08T00:00:00</ns19:BeforeOn>
    </ns19:SpecificTime>
</ns19:TimeEvent>
                                </ns19:TimeCondition>
                                <ns19:Operator1 name="AND"/>
                                <ns19:PeerCondition>
<ns19:PeerEvent name="=" location="infix">
    <ns24:PlaceType xmlns:ns24="urn:mpeg:mpeg7:schema:2001">
        <Region>kr</Region>
    </ns24:PlaceType>
</ns19:PeerEvent>
                                </ns19:PeerCondition>
                                <ns19:Operator1 name="OR"/>
                                <ns19:DIOperationCondition>
<ns19:DIOperationEvent>
    <ns19:Operation>Play</ns19:Operation>
    <ns19:DII>mpeg:mpeg21:dii:ID:ACME-010</ns19:DII>
</ns19:DIOperationEvent>
                                </ns19:DIOperationCondition>
                            </ns19:EventConditionDescriptor>
                        </ns19:ERR>
                    </ns16:Statement>
                </ns16:Description>
                <ns16:Component>
                    <ns16:Resource mimeType="application/mp21-ipmp">
                        <ns20:ProtectedAsset mimeType="video/avi">
                            <ns20:Identifier>urn:cedeo:iptv-mp:contentelement:da89fd59-b5d5-49a3-859a-
ff5d90b84a2e</ns20:Identifier>
                            <ns20:Info>
                                <ns2:IPMPInfoDescriptor>
<ns2:Tool>
    <ns2:ToolBaseDescription>
        <ns2:IPMPToolID>org.dmp.chillout.auxiliary.drmtool.gstreamer.des video</ns2:IPMPToolID>
    </ns2:ToolBaseDescription>
    <ns2:InitializationSettings>
        <ns2:InitializationData>
            <ns6:ControlPointID>
                <ns6:ID>4</ns6:ID>
            </ns6:ControlPointID>
            <ns6:KeyData>
                <ns6:dataID>0</ns6:dataID>
                <ns6:TimeKey>
                    <ns8:EncryptedKey>
                        <ns8:EncryptionMethod Algorithm="AES"></ns8:EncryptionMethod>
                        <ns8:CipherData>
                            <ns8:CipherValue>RJW9G9CGYS5a1L+D9fZSAw==</ns8:CipherValue>
                        </ns8:CipherData>
```

```xml
                    </ns8:EncryptedKey>
                    <ns6:startDTS>0</ns6:startDTS>
                    <ns6:expireDTS>3</ns6:expireDTS>
                </ns6:TimeKey>
                <ns6:TimeKey>
                    <ns8:EncryptedKey>
                        <ns8:EncryptionMethod Algorithm="AES"></ns8:EncryptionMethod>
                        <ns8:CipherData>
                            <ns8:CipherValue>jp+RmPNOR519f4NFq9xOaQ==</ns8:CipherValue>
                        </ns8:CipherData>
                    </ns8:EncryptedKey>
                    <ns6:startDTS>4</ns6:startDTS>
                    <ns6:expireDTS>6</ns6:expireDTS>
                </ns6:TimeKey>
                <ns6:TimeKey>
                    <ns8:EncryptedKey>
                        <ns8:EncryptionMethod Algorithm="AES"></ns8:EncryptionMethod>
                        <ns8:CipherData>
                            <ns8:CipherValue>2XY5aPn6KlmNG20eUK25sw==</ns8:CipherValue>
                        </ns8:CipherData>
                    </ns8:EncryptedKey>
                    <ns6:startDTS>7</ns6:startDTS>
                    <ns6:expireDTS>9</ns6:expireDTS>
                </ns6:TimeKey>
            </ns6:KeyData>
        </ns2:InitializationData>
    </ns2:InitializationSettings>
</ns2:Tool>
<ns2:RightsDescriptor>
    <ns2:License>
        <ns9:license licenseId="64aff71a-0e50-47ed-b7b6-fef35ad76494">
            <ns9:inventory>
                <ns11:protectedResource licensePartId="d2acc0b6-d0c2-4fae-9143-334b42850983">
                    <ns9:digitalResource>
                        <ns9:nonSecureIndirect URI="urn:cedeo:iptv-mp:contentelement:da89fd59-b5d5-
49a3-859a-ff5d90b84a2e"/>
                    </ns9:digitalResource>
                    <ns8:EncryptedKey>
                        <ns8:EncryptionMethod Algorithm="http://www.w3.org/2001/04/xmlenc#rsa-1 5"/>
                        <ns3:KeyInfo>
                            <ns3:KeyName>WebTV's RSA Public Key</ns3:KeyName>
                        </ns3:KeyInfo>
                        <ns8:CipherData>
<ns8:CipherValue>MxYxdlSxLmfhTx7TU7vSm8z2UJ+iwLlNbQswEYTh8EIVOjApGPlPu9prBKieGQfYpORJra/HMIybwZI4zI5o
4joURQOhu12fqBQ1rwL5yIGq0feH/9Rg+nnAauQlqCWorSLzXFZVclSmRel9AiMSgvdFPpU1d9DRJrgvxmePzTQ=</ns8:CipherV
alue>
                        </ns8:CipherData>
                        <ns8:CarriedKeyName>Master key for digital Resource</ns8:CarriedKeyName>
                    </ns8:EncryptedKey>
                </ns11:protectedResource>
            </ns9:inventory>
            <ns9:grant>
                <ns9:keyHolder>
                    <ns9:info>
                        <ns3:KeyName>WebTV</ns3:KeyName>
                        <ns3:KeyValue>
                            <ns3:RSAKeyValue>
<ns3:Modulus>AJaAZo4UQEdm5eDCQQqDg9/YguFd0ryLFHWOusJ1mT8Sc2nFB4qeuntL7bANlHKltHXlifff50nQ0U8XGkEqig1n
p/nkeQE8Mc/U/zOfeKSpr+PLaYEHA0+Mbm6CwRAqk9lRjzg43mvtep1qehB+qDUF8d3fdaR/a4uVv23dWRPZ</ns3:Modulus>
<ns3:Exponent>AQAB</ns3:Exponent>
                            </ns3:RSAKeyValue>
                        </ns3:KeyValue>
                    </ns9:info>
                </ns9:keyHolder>
                <ns12:play/>
                <ns11:protectedResource licensePartIdRef="d2acc0b6-d0c2-4fae-9143-334b42850983"/>
            </ns9:grant>
            <ns9:grant>
                <ns9:keyHolder>
                    <ns9:info>
                        <ns3:KeyName>WebTV</ns3:KeyName>
                        <ns3:KeyValue>
                            <ns3:RSAKeyValue>
<ns3:Modulus>AJaAZo4UQEdm5eDCQQqDg9/YguFd0ryLFHWOusJ1mT8Sc2nFB4qeuntL7bANlHKltHXlifff50nQ0U8XGkEqig1n
p/nkeQE8Mc/U/zOfeKSpr+PLaYEHA0+Mbm6CwRAqk9lRjzg43mvtep1qehB+qDUF8d3fdaR/a4uVv23dWRPZ</ns3:Modulus>
```

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```
<ns3:Exponent>AQAB</ns3:Exponent>
                                </ns3:RSAKeyValue>
                            </ns3:KeyValue>
                        </ns9:info>
                    </ns9:keyHolder>
                    <ns11:governedCopy/>
                    <ns11:protectedResource licensePartIdRef="d2acc0b6-d0c2-4fae-9143-334b42850983"/>
                </ns9:grant>
                <ns9:grant>
                    <ns9:forAll varName="b334be06-8f52-47dc-af89-c6eea49bf7db">
                        <ns9:propertyPossessor>
                            <ns10:propertyUri definition="WTV A:USERS"/>
                            <ns9:trustedRootIssuers>
                                <ns9:keyHolder>
<ns9:info>
    <ns3:KeyName>WebTV</ns3:KeyName>
    <ns3:KeyValue>
        <ns3:RSAKeyValue>

<ns3:Modulus>AIoDvmn2dczuJEoqAGGhx+60CzHZHe+CnDmXmFGC+IP7PtJaxZKso7cvjY4Dkucalk/OFmH+l0NzsEgSqJG0CS3x
xB1d3YjTVZwrYUPVz6thYqDd8PhA/WZDJn6DFDF49adoYzGXBvhB0NhP4mwEaj3KpBxeG9zTQo6w0HTFE7VV</ns3:Modulus>
            <ns3:Exponent>AQAB</ns3:Exponent>
        </ns3:RSAKeyValue>
                            </ns3:KeyValue>
                        </ns9:info>
                                </ns9:keyHolder>
                            </ns9:trustedRootIssuers>
                        </ns9:propertyPossessor>
                    </ns9:forAll>
                    <ns9:keyHolder>
                        <ns9:info>
                            <ns3:KeyName>WebTV</ns3:KeyName>
                            <ns3:KeyValue>
                                <ns3:RSAKeyValue>
<ns3:Modulus>AJaAZo4UQEdm5eDCQQqDg9/YguFd0ryLFHWOusJ1mT8Sc2nFB4qeuntL7bANlHKltHXlifff50nQ0U8XGkEqig1n
p/nkeQE8Mc/U/zOfeKSpr+PLaYEHA0+Mbm6CwRAqk9lRjzg43mvtep1qehB+qDUF8d3fdaR/a4uVv23dWRPZ</ns3:Modulus>
<ns3:Exponent>AQAB</ns3:Exponent>
                                </ns3:RSAKeyValue>
                            </ns3:KeyValue>
                        </ns9:info>
                    </ns9:keyHolder>
                    <ns9:issue/>
                    <ns9:grantGroup>
                        <ns9:grant>
                            <ns9:principal varRef="b334be06-8f52-47dc-af89-c6eea49bf7db"/>
                            <ns12:play/>
                            <ns11:protectedResource licensePartIdRef="d2acc0b6-d0c2-4fae-9143-
334b42850983"/>
                            <ns10:feePerUse>
                                <ns10:rate>
<ns10:amount>10.0</ns10:amount>
<ns10:currency xmlns:iso="urn:mpeg:mpeg21:2003:01-REL-SX-NS:currency">iso:EUR</ns10:currency>
                                </ns10:rate>
                                <ns10:to>
<ns22:ServiceInformation>
    <ns22:ServiceID>205</ns22:ServiceID>
    <ns22:ServiceURL>http://localhost:6996/services/</ns22:ServiceURL>
</ns22:ServiceInformation>
                                </ns10:to>
                            </ns10:feePerUse>
                        </ns9:grant>
                        <ns9:grant>
                            <ns9:encryptedGrant>
                                <ns8:EncryptionMethod Algorithm="http://www.w3.org/2001/04/xmlenc#rsa-
1_5"></ns8:EncryptionMethod>
                                <ns3:KeyInfo>
<ns3:KeyName>Encrypted Grant with Public Key</ns3:KeyName>
                                </ns3:KeyInfo>
                                <ns8:CipherData>
<ns8:CipherValue>d2v3J5t+NJdAxqpq/A0qfKss0v6VPYRujwNmH9ZD8SJA4IFnjLpIuqeWnmw1Ld2h34xoiCmeizqsmUix8d4M
rQMX5pbNHLwU7D0Z4WAVsXmfd/mHxfk3mMaJvnFrDSwRW8o/19uOawIvGPt9P3MJB2VoxAx1ZtGfaQS4Ite+GJ4=</ns8:CipherV
alue>
                                </ns8:CipherData>
                            </ns9:encryptedGrant>
                        </ns9:grant>
                    </ns9:grantGroup>
```

```
                    </ns9:grant>
                    <ns9:issuer>
                        <ns9:keyHolder>
                            <ns9:info>
                                <ns3:KeyName>Syn1</ns3:KeyName>
                                <ns3:KeyValue>
                                    <ns3:RSAKeyValue>
<ns3:Modulus>AKwvWWPDFylZWy4C3HfvaBq05strqcIiLiPLjjSC/un4HI1meJvV9+fHPzs0d8NORFOIe6TREhvUTwLEZNxkgJss
qUmybqpfdX/H7v3T8zIRBlUMNwGgo53q5zkth1vlIHpaHqpjqdGGkBw8hTb9jy/JbJNdiNoqX0vuVkQUaUDb</ns3:Modulus>
<ns3:Exponent>AQAB</ns3:Exponent>
                                    </ns3:RSAKeyValue>
                                </ns3:KeyValue>
                            </ns9:info>
                        </ns9:keyHolder>
                    </ns9:issuer>
                </ns9:license>
            </ns2:License>
        </ns2:RightsDescriptor>
                                </ns2:IPMPInfoDescriptor>
                            </ns20:Info>
                            <ns20:Contents ref="prova.avi"></ns20:Contents>
                        </ns20:ProtectedAsset>
                    </ns16:Resource>
                </ns16:Component>
            </ns16:Item>
        </ns16:Item>
</ns16:DIDL>
```

J.4.1.3   WebTV's Template DI

```
<?xml version="1.0" encoding="UTF-8" standalone="yes"?>
<ns16:DIDL xmlns:ns2="urn:mpeg:mpeg21:2004:01-IPMPINFO-NS"
xmlns:ns3="http://www.w3.org/2000/09/xmldsig#"
xmlns:ns4="urn:mpeg:maf:Schema:mediastreaming:IPMPINFOextensions:2007"
xmlns:ns5="urn:mpeg:mpeg4:IPMPSchema:2002" xmlns:ns6="urn:mpeg:mpegB:schema:IPMP-XML-MESSAGES:2007"
xmlns:ns7="urn:mpeg:mpeg21:2002:01-DII-NS" xmlns:ns8="http://www.w3.org/2001/04/xmlenc#"
xmlns:ns9="urn:mpeg:mpeg21:2003:01-REL-R-NS" xmlns:ns10="urn:mpeg:mpeg21:2003:01-REL-SX-NS"
xmlns:ns11="urn:mpeg:mpeg21:2005:01-REL-M1X-NS" xmlns:ns12="urn:mpeg:mpeg21:2003:01-REL-MX-NS"
xmlns:ns13="urn:mpeg:mpeg21:2006:01-REL-M2X-NS" xmlns:ns14="urn:mpeg:mpeg21:2006:01-REL-M3X-NS"
xmlns:ns15="urn:iptv-mp:2009:01-REL-IPTV-MP" xmlns:ns16="urn:mpeg:mpeg21:2006:07-DIDL-NS"
xmlns:ns17="urn:mpeg:mpeg21:2002:02-DIDMODEL-NS"
xmlns:ns18="urn:mpeg:maf:schema:mediastreaming:DIDextensions" xmlns:ns19="urn:mpeg:mpeg21:2005:01-
ERL-NS" xmlns:ns20="urn:mpeg:mpeg21:2004:01-IPMPDIDL-NS" xmlns:ns21="urn:mpeg:mpeg7:smp:schema:2001"
xmlns:ns22="urn:dmp:idp:represent:PaymentProtocol:2008" xmlns:ns23="urn:mpeg:mpeg-
m:schema:baseprotocol:2009">
    <ns16:Item id="A0">
        <ns16:Descriptor>
            <ns16:Statement mimeType="text/xml">
                <ns7:Identifier>urn:cedeo:iptv-mp:content:fe43dc7f-0bf0-4bcf-b2d5-
5c47123229be</ns7:Identifier>
            </ns16:Statement>
        </ns16:Descriptor>
        <ns16:Descriptor>
            <ns16:Statement mimeType="text/xml">
                <ns18:Metadata>
                    <ns18:StructuredData ref="urn:mpeg:mpeg7:smp:schema:2001">
                        <ns21:Mpeg7>
                            <ns21:Description xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:type="ns21:CreationDescriptionType">
<ns21:CreationInformation>
    <ns21:Creation>
        <ns21:Title xml:lang="en">The BIG Lebowsky</ns21:Title>
        <ns21:Abstract>
            <ns21:FreeTextAnnotation xml:lang="en">Her life was in their hands. Now her toe is in the
mail.</ns21:FreeTextAnnotation>
        </ns21:Abstract>
        <ns21:Creator>
            <ns21:Role href="urn:mpeg:mpeg7:cs:RoleCS:2001:ACTOR"/>
            <ns21:Agent xsi:type="ns21:PersonType">
                <ns21:Name>
                    <ns21:GivenName>Jeff</ns21:GivenName>
                    <ns21:FamilyName>Bridges</ns21:FamilyName>
                </ns21:Name>
```

```
                </ns21:Agent>
            </ns21:Creator>
        <ns21:CreationCoordinates>
            <ns21:Date>
                <ns21:TimePoint>1998-05-01T00:00:00</ns21:TimePoint>
            </ns21:Date>
        </ns21:CreationCoordinates>
    </ns21:Creation>
    <ns21:Classification>
        <ns21:Genre href="urn:mpeg:mpeg7:cs:GenreCS:2001:2.1.2">
            <ns21:Name preferred="true" xml:lang="en">Comedy</ns21:Name>
        </ns21:Genre>
    </ns21:Classification>
</ns21:CreationInformation>
                            </ns21:Description>
                        </ns21:Mpeg7>
                    </ns18:StructuredData>
                </ns18:Metadata>
            </ns16:Statement>
        </ns16:Descriptor>
        <ns16:Item id="B0">
            <ns16:Descriptor>
                <ns16:Statement mimeType="text/xml">
                    <ns7:Identifier>urn:cedeo:iptv-mp:contentelement:da89fd59-b5d5-49a3-859a-
ff5d90b84a2e</ns7:Identifier>
                </ns16:Statement>
            </ns16:Descriptor>
            <ns16:Descriptor>
                <ns16:Statement mimeType="text/xml">
                    <ns18:Metadata>
                        <ns18:StructuredData ref="urn:mpeg:mpeg7:smp:schema:2001">
                            <ns21:Mpeg7>
<ns21:Description xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:type="ns21:CreationDescriptionType">
    <ns21:CreationInformation>
        <ns21:Creation>
            <ns21:Title xml:lang="en">The BIG Lebowsky</ns21:Title>
            <ns21:Abstract>
                <ns21:FreeTextAnnotation xml:lang="en">Her life was in their hands. Now her toe is in
the mail.</ns21:FreeTextAnnotation>
            </ns21:Abstract>
            <ns21:Creator>
                <ns21:Role href="urn:mpeg:mpeg7:cs:RoleCS:2001:ACTOR"/>
                <ns21:Agent xsi:type="ns21:PersonType">
                    <ns21:Name>
                        <ns21:GivenName>Jeff</ns21:GivenName>
                        <ns21:FamilyName>Bridges</ns21:FamilyName>
                    </ns21:Name>
                </ns21:Agent>
            </ns21:Creator>
            <ns21:CreationCoordinates>
                <ns21:Date>
                    <ns21:TimePoint>1998-05-01T00:00:00</ns21:TimePoint>
                </ns21:Date>
            </ns21:CreationCoordinates>
        </ns21:Creation>
        <ns21:Classification>
            <ns21:Genre href="urn:mpeg:mpeg7:cs:GenreCS:2001:2.1.2">
                <ns21:Name preferred="true" xml:lang="en">Comedy</ns21:Name>
            </ns21:Genre>
        </ns21:Classification>
    </ns21:CreationInformation>
</ns21:Description>
                            </ns21:Mpeg7>
                        </ns18:StructuredData>
                    </ns18:Metadata>
                </ns16:Statement>
            </ns16:Descriptor>
            <ns16:Component>
                <ns16:Resource mimeType="application/mp21-ipmp">
                    <ns20:ProtectedAsset mimeType="video/avi">
                        <ns20:Identifier>urn:cedeo:iptv-mp:contentelement:da89fd59-b5d5-49a3-859a-
ff5d90b84a2e</ns20:Identifier>
                        <ns20:Info>
                            <ns2:IPMPInfoDescriptor>
<ns2:Tool>
```