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Multimedia home server systems – Rights information interoperability for IPTV

Systèmes de serveur domestique multimédia – Interopérabilité d'information des droits pour TVIP

[IEC 62698:2013](#)

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**MULTIMEDIA HOME SERVER SYSTEMS –
RIGHTS INFORMATION INTEROPERABILITY FOR IPTV**

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International Standard IEC 62698 has been prepared by technical area 8: Multimedia home server systems, of IEC technical committee 100: Audio, video and multimedia systems and equipment.

Parts of the text of this standard have been developed in collaboration with ITU-T/Study Group 16: Multimedia application platforms and end systems for IPTV.

NOTE The ITU-T Recommendation, which is the parallel text of this standard, is ITU-T Recommendation H.751 "Metadata for rights information interoperability in IPTV services" and is under revision/approval. See ITU website for more details.

The text of this standard is based on the following documents:

CDV	Report on voting
100/1947/CDV	100/1998/RVC

Full information on the voting for the approval of this standard can be found in the report on voting indicated in the above table.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

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INTRODUCTION

At present, there are no mechanisms or rules for flexible digital distribution that allow the easy exchange of content based on individual commitments between content creators and consumers. This is because a technological and social environment where there is a sense of trust between copyright holders and consumers who feel safe about information distribution is not always perfectly provided.

To provide content creators and consumers with this type of content usage environment, to give them more opportunities for all kinds of digital content regardless of the support they use to store it, interoperability is required that will enable the IPTV systems and equipment that make up the envisioned value chain to communicate and work with each other across different systems which manage content distribution.

Rights Information Interoperability (RII) solves these issues by helping to provide content rights holders and consumers with common semantics and core elements that extend across different systems which manage content distribution.

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MULTIMEDIA HOME SERVER SYSTEMS – RIGHTS INFORMATION INTEROPERABILITY FOR IPTV

1 Scope

This International Standard defines the common semantics and core elements on rights information interoperability for IPTV systems/equipment that is subject to multimedia content to be used across different platforms legally.

The rights information includes rights and security related metadata that is described in ITU-T Recommendation H.750.

Rights related information, such as content ID, permission issuer ID and permission receiver ID, which is used to bridge between rights related metadata, is considered in this standard. On the other hand, rights management and content protection technology are beyond the scope of this standard.

2 Normative references

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

IEC 62227:2008, *Multimedia home server systems – Digital rights permission code*

IEC/TR 62636:2009, *Multimedia home server systems – Implementation of digital rights permission code*

ISO 3166-1, *Codes for the representation of names of countries and their subdivisions – Part 1: Country codes*

ITU-T Recommendation H.750:2009, *High-level specification of metadata for IPTV services*

ITU-T Recommendation X.509, *Information technology – Open systems interconnection – The Directory: Public-key and attribute certificate frameworks*

3 Abbreviations and acronyms

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

AAC	Advanced Audio Coding
AACS	Advanced Access Content System
CD	Compact Disc
CGMS	Copy Generation Management System
CM	Commercial Message
CPRM	Content Protection for Recordable Media
DCF	DRM Content Format
DRM	Digital Rights Management

DRPC	Digital Rights Permission Code
DSA	Digital Signature Algorithm
DTCP	Digital Transmission Content Protection
DVD	Digital Versatile Disk
EC-DSA	Elliptic Curve Digital Signature Algorithm
GC	Group Content
GIF	Graphic Interchange Format
HD	High Definition
HDCP	High-bandwidth Digital Content Protection
HDD	Hard Disk Drive
ID	Identifier
IPTV	Internet Profile TeleVision
JPEG	Joint Photographic Experts Group
MP3	MPEG Audio Layer-3
MPEG	Moving Picture Experts Group
MTMO	Marlin Trust Management Organization
OMA	Open Mobile Alliance
PCM	Pulse Code Modulation
PNG	Portable Network Graphics
RII	Rights Information Interoperability
RSA	Rivest Shamir Adleman
SAFIA	Security Architecture For Intelligent Attachment
SHA	Secure Hash Algorithm
VCPS	Video Content Protection System
VOD	Video On Demand
WIPO	World Intellectual Property Organization

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4 Systems: the RII environment

4.1 General

This standard gives the high-level standard of the metadata for rights information interoperability, including representation of the minimum required elements.

The RII metadata provides descriptive and contextual classification for representing rights information using the permission framework.

RII is concerned with finding the greatest common denominators in rights expressions that include the minimum required components when trying to implement the mutual use of rights information.

It is about conveying rights information in units of groups of context expressions called permissions.

Here we consider the constituent components of permissions. Permissions can encode “what from whom to whom under what conditions” using context expressions. When permissions are sent to a terminal, the minimum required components are the subject information in the permissions that corresponds to the “what from whom to whom” part, and the content usage information that corresponds to the “under what conditions” part.

4.2 Permission subjects

One permission subject is the issuer information that expresses the “from whom” part of the permissions. This information is held by the service provider, and in RII, its minimum required component is the rights holder ID.

Only the issuer ID is included because in RII, it is sufficient if the service provider and the terminal can identify who is granting the permissions. It is not necessary to send all of the issuer information from the server to the terminal. Therefore, the rights holder ID corresponds to the Issuer ID in RII context expressions. The service provider receives the digital rights permission code from the terminal and loads the rights holder ID included in the Issuer ID to identify the rights holder who granted the permissions.

Another permission subject is receiver information that expresses the “to whom” part of the permissions. In RII, that minimum required component is the User ID/Device ID.

Only the receiver ID is included because in RII, it is sufficient if the service provider and the terminal can identify to whom the permissions are being granted. Therefore, the User ID/Device ID corresponds to the Receiver ID in RII context expressions. The terminal receives the digital rights permission code from the service provider and determines whether or not the User ID/Device ID included in the Receiver ID corresponds to the local terminal, or the service provider receives the digital rights permission code from the terminal and loads the User ID/Device ID included in the Receiver ID to identify the user to whom permissions were granted.

Another permission subject is information about the content for which permissions are being granted, which is expressed in the “what” part. In RII, that minimum required component is the Content ID.

Only the Content ID is included in RII because it is sufficient for the service provider and the terminal to be able to identify the content for which permissions are being granted. The terminal receives the digital rights permission code from the service provider and determines that the content that corresponds to the Content ID is being granted.

4.3 Permission limit components

One permission limit component is the type of the permissions (hereinafter referred to as “the permission classification component”), which expresses stipulations about what is being granted. These permissions are agreed upon between the issuer and the receiver. This is information that the receiver needs to be able to check offline. In RII, those minimum required components are the following: a type that indicates whether the permission content being granted is public or not (hereinafter referred to as “the disclosure class”), a type that indicates the purpose of use being granted (hereinafter referred to as the “purpose class”), a type that indicates the billing format being granted (hereinafter referred to as the “charge model class”), a type that indicates the request format being granted (hereinafter referred to as the “request class”), a type that indicates the sponsor format being granted (hereinafter referred to as the “sponsor class”), a type that indicates the usage format being granted (hereinafter referred to as the “usage class”), and a type that indicates the territory being granted, (hereinafter referred to as the “territory class”). These permission limit components are included in RII because it is necessary to be able to see that information even in an offline environment that is not connected to a network. This is so that the terminal can determine what type of permissions are being granted between the service provider and the terminal.

Another permission limit component contains limiting conditions that are in addition to the restrictions in the items granted above. These are mainly items of information that limit the type of permissions stipulated by the usage class. In RII, those minimum required components are the permission usage format and its limiting conditions (hereinafter referred to as “normal usage limits”), content usage limits for compliant terminals (hereinafter referred to as the “permission management system limits”), and the limits on output of the content to non-compliant terminals or media (hereinafter referred to as the “simultaneous output limits”).

These permission limit components are included in RII, because it is necessary for the rights they correspond to, to be seen on the terminal even in an offline environment that is not connected to a network. This is so that the terminal can determine under what conditions the types of permissions are limited between the service provider and the terminal.

RII does not provide a method of encoding context expressions for permissions. The encoding method is already standardized using existing standard technology. Instead, Clause B.2 shows the example of adding context expressions expressed using natural language in IEC 62227 (DRPC).

RII is a set of items to be considered when each content is distributed and permission for such distribution is generated.

Therefore RII is not defined from a technical perspective, but rather on the basis of permission information that rights holders actually employ in the field. RII itself does not have the ability to regulate content usage behaviour.

Restricting the use of content to terms specified in the permission is an administrative issue or a DRM systems issue. RII does not have exclusive policy. Implementers of each DRM or content distribution systems can choose their own subset and usage scheme of RII, based on their necessity and resource. They can even limit the application to a simple displaying of permission and not use their rights management.

5 Permission subject identifiers

5.1 Permission subject identifiers

Permission subject identifiers is comprised of three identifiers: Content identifier assigned to the subject content, Issuer identifier and Receiver identifier respectively, assigned to each permission issuer and receiver.

5.2 Content identifier

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Content identifier is information to uniquely identify the content. It is required to be assigned to each content that is subject to permission. IEC 62227:2008, 5.5.4, specifies permission subject content identifiers.

5.3 Issuer identifier

Issuer identifier is information to uniquely identify the permission issuer. Issuer identifier may be used not only to identify a rights holder, a service provider and a home server, but also for consumption tracking, rights report and content management. IEC 62227:2008, 5.5.5, specifies permission subject issuer identifiers.

5.4 Receiver identifier

Receiver identifier is information to uniquely identify the permission receiver. Receiver identifier may be used to identify an end-user, a device and a set of end-users. IEC 62227:2008, 5.5.6, specifies permission subject receiver identifiers.

6 Permission classification

6.1 Permission classification

Permission classification indicates the class of the permission. It should be described according to the conditions indicated in the permission agreement.

6.2 Disclosure class

Disclosure class includes classification indicating whether a given permission is a closed permission for a specified player or an open permission for an unspecified group of players. The closed permission information can be accessed by the permission issuer and receiver. Possible values are “open permission”, “closed permission” and “other”. Open permission is the permission that is received according to previously arranged default conditions. Closed permission is the permission that is received through a separate, individually negotiated contract.

IEC 62227:2008, 5.6.4, specifies a permission classification for signalling and carrying disclosure information. Clause B.2 of IEC/TR 62636:2009, provides use-case scenarios to implement the disclosure class.

6.3 Purpose class

Purpose class includes classification indicating the purpose of content usage, such as commercial, public, education, not-for-profit and promotion. To ensure the consumption of content under the condition could be subject to domain management. Possible values are “commercial”, “public”, “non-profit”, “promotion”, “education” and “other”.

Commercial permission is the permission for a business use. Public permission is the permission for a public use. Non-profit permission is the permission for a public use. Promotion permission is the permission for a promotion use. Education permission is the permission for an education use.

IEC 62227:2008, 5.6.5, specifies a permission classification for signalling and carrying usage purpose information. Clause B.2 of IEC/TR 62636:2009, provides use-case scenarios to implement the usage purpose class.

6.4 Charge model class

Charge model class includes classification including the charge method such as free-of-charge and for-charge. The charge model class might include “pay-per-view” (charged per viewing), and “subscription” (fixed periodic charge). Both of these conditions should not be used at the same time, but rather if one is selected the other is not used. Possible values are “free of charge”, “pay per use”, “subscription”, “coupon”.

IEC 62227:2008, 5.6.6, specifies a permission classification for signalling and carrying charge model information. Clause B.2 of IEC/TR 62636:2009, provides use-case scenarios to implement the charge model class.

6.5 Sponsor class

Sponsor class includes classification indicating the sponsor type such as advertising model, premium model, coupon model and consumption information disclosure model.

Advertising model describes the condition of viewing ads in the content consumption. Premium model, coupon model and consumption information disclosure model describe the conditions for the content acquisition. In the premium model there can be a specific advertiser to sponsor specific content. In the coupon model there can be multiple advertisers to sponsor the content. In disclosure model the content can be exchanged for end-user consumption information. The control of trick play and the function of point exchange are required to be implemented for these models. Possible values are “No sponsor”, “Advertisement model without force viewing”, “Advertisement model with force viewing”, “Advertisement model with pre/post viewing”, “Advertisement model with alternative viewing”, “Advertisement model with blanket viewing”, “Premium model”, “Coupon model”, “Privacy information disclosure model” and “Other”.

IEC 62227:2008, 5.6.9, specifies a permission classification for signalling and carrying sponsor information. IEC/TR 62636:2009, 5.17, and IEC/TR 62636:2009, 5.18, provide use-case scenarios to implement the sponsor class.

6.6 Territory class

Territory class includes classification indicating the territory of content consumption such as country and region. It is required to implement the technology, such as domain management, to specify the territory in which content is consumed. Possible values are region code, country code (ISO 3166-1) and Zip code.

IEC 62227:2008, 5.6.10, specifies a permission classification for signalling and carrying territory information. Clause B.2 of IEC/TR 62636:2009, provides use-case scenarios to implement the territory class.

6.7 Usage class

Usage class includes classification indicating the usage type such as transmission type, store type, reuse type, and redistribution type based on usage environment.

IEC 62227:2008, 5.6.11, specifies a permission classification for signalling and carrying usage information. Clause B.2 of IEC/TR 62636:2009, provides use-case scenarios to implement the usage class.

Elements required in usage class are listed below.

- Transmission type expresses an distribution form of content into target domains and conformance devices. For example, if the value is "download", the content can be downloaded into conformance devices. Possible values are "broadcast", "streaming", "download" and "physical media".
 - IEC 62227:2008, 5.6.11.2, `usage_type`, specifies a permission classification for signalling and carrying usage class information.
- Store type expresses an accumulation form of content in target domains and conformance devices. For example, if the value is "fixation", the content can be stored in conformance devices. Possible values are "fixation" and "non-fixation".
 - IEC 62227:2008, 5.6.11.2, `usage_type`, specifies a permission classification for signalling and carrying usage class information.
- Reuse type expresses the secondary usage type of content in target domains and compliance devices. Possible values are enable or disable of secondary usage, move, copy, export, share, edit, modify and super distribution.
 - IEC 62227:2008, 5.6.11.4, `move_flag`, 5.6.11.5, `copy_flag`, 5.6.11.6, `export_flag`, 5.6.11.7, `share_flag`, 5.6.11.8, `edit_flag`, 5.6.11.9, `modify_flag`, 5.6.11.10, `super_distribution_flag`, specifies a permission classification for signalling and carrying usage class information.
- Redistribution type expresses the forwarding type of content from target domains and compliance devices (e.g. enable or disable).
 - IEC 62227:2008, 5.6.11.3, `redistribution_type`, specifies a permission classification for signalling and carrying usage class information.

6.8 Compilation class

Compilation class includes classification indicating content depending on whether or not the permission issuer is allowed to combine and sell multiple pieces of content. It is required to ensure consistency in playback with playlist. Possible values are true if play-list is enabled, false, if play-list is disabled.

IEC 62227:2008, 5.7.3.2.6, `playlist_parameter`, specifies a permission condition for signalling and carrying compilation information.

7 Permission limit components

7.1 Permission limit components

Classification limit components include information indicating the restriction of the permission conditions that is described in the permission classification. It can be described for restricting the conditions indicated in the permission agreement.

7.2 General usage condition

7.2.1 General

General usage condition is an element comprising a usage form and its limit conditions under which the content can be permitted to be used in target domains and compliant devices. It includes information restricting the usage condition for content consumption such as playback usage, print usage and execute usage.

Playback usage is an element of the usage form that the content can be rendered temporarily under keeping perceptible. Playback usage condition expresses the limit that the content can be permitted to playback in target domains and compliance devices.

IEC 62227:2008, 5.7.3.2, specifies a permission constraint for signalling and carrying playback condition.

Print usage is an element of the usage form that the content can be rendered permanently on the physically fixed object. Print usage condition expresses the limit that the content can be permitted to print in target domains and compliance devices.

IEC 62227:2008, 5.7.3.3, specifies a permission constraint for signalling and carrying print condition.

Execution usage is an element of the usage form that the content can be rendered temporarily with the calculation process. Execution usage condition expresses the limit that the content can be permitted to execute in target domains and compliance devices.

IEC 62227:2008, 5.7.3.4, specifies a permission constraint for signalling and carrying execution condition.

7.2.2 Quality limits

Quality limits includes information indicating the quality of distributed content. Permission issuers typically represent it as qualitative levels such as LEVEL1 (high quality), LEVEL2 (standard quality), LEVEL3 (low quality) and LEVEL4 (other). For example, if the value is "LEVEL1", the content can be permitted to use (play, print or execute) with the best quality. Possible values are "LEVEL1", "LEVEL2", "LEVEL3" and "LEVEL4".

IEC 62227:2008, 5.7.3.2.4, quality_parameter, specifies a quality condition for playback usage. IEC 62227:2008, 5.7.3.3.4, quality_parameter, specifies a quality condition for print usage. IEC 62227:2008, 5.7.3.4.4, service_level_parameter, specifies a quality condition for execution usage.

7.2.3 Lifetime limits

Lifetime limits includes information indicating the lifetime of distributed content. Permission issuers typically specify time period, day count and date period.

Elements required in lifetime limits are listed below.

NOTE Unless otherwise specified, the subclause references within the same dashed paragraph all refer to IEC 62227:2008, as indicated at the beginning of each dashed item.

- Time period expresses the number of hours during which the content is permitted to be used (play, print or execute) in target domains and compliance devices. For example, if the value is twenty-four, the content can be used for 24 h after its reception in compliance devices. Possible values are natural numbers and the unit is hour (e.g., 24 h, 48 h).