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SERIES J: CABLE NETWORKS AND TRANSMISSION OF TELEVISION, SOUND PROGRAMME AND OTHER MULTIMEDIA SIGNALS

Ancillary digital services for television transmission

Metadata requirements for video-on-demand in cable networks

ITU-T Recommendation J.98

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ITU-T Recommendation J.98

Metadata requirements for video-on-demand in cable networks

Summary

The purpose of this Recommendation is to describe requirements at the cable operator's headend for Video-on-Demand (VoD) metadata. It is envisioned that an industry standard will promote new marketing opportunities, interoperability of assets, and reduce costs to cable operators and their customers.

Source

ITU-T Recommendation J.98 was prepared by ITU-T Study Group 9 (2001-2004) and approved under the WTSA Resolution 1 procedure on 14 May 2003.

FOREWORD

The International Telecommunication Union (ITU) is the United Nations specialized agency in the field of telecommunications. The ITU Telecommunication Standardization Sector (ITU-T) is a permanent organ of ITU. ITU-T is responsible for studying technical, operating and tariff questions and issuing Recommendations on them with a view to standardizing telecommunications on a worldwide basis.

The World Telecommunication Standardization Assembly (WTSA), which meets every four years, establishes the topics for study by the ITU-T study groups which, in turn, produce Recommendations on these topics.

The approval of ITU-T Recommendations is covered by the procedure laid down in WTSA Resolution 1.

In some areas of information technology which fall within ITU-T's purview, the necessary standards are prepared on a collaborative basis with ISO and IEC.

NOTE

In this Recommendation, the expression "Administration" is used for conciseness to indicate both a telecommunication administration and a recognized operating agency.

Compliance with this Recommendation is voluntary. However, the Recommendation may contain certain mandatory provisions (to ensure e.g. interoperability or applicability) and compliance with the Recommendation is achieved when all of these mandatory provisions are met. The words "shall" or some other obligatory language such as "must" and the negative equivalents are used to express requirements. The use of such words does not suggest that compliance with the Recommendation is required of any party.

INTELLECTUAL PROPERTY RIGHTS

ITU draws attention to the possibility that the practice or implementation of this Recommendation may involve the use of a claimed Intellectual Property Right. ITU takes no position concerning the evidence, validity or applicability of claimed Intellectual Property Rights, whether asserted by ITU members or others outside of the Recommendation development process.

As of the date of approval of this Recommendation, ITU had not received notice of intellectual property, protected by patents, which may be required to implement this Recommendation. However, implementors are cautioned that this may not represent the latest information and are therefore strongly urged to consult the TSB patent database.

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ITU-T Recommendation J.98

Metadata requirements for video-on-demand in cable networks

1 Scope

This Recommendation describes requirements in a cable operator's headend for Video-on-Demand (VoD) metadata. It enables a consistent level of features and offerings for VoD services that require metadata. As illustrated in Figure 1, this Recommendation, along with other metadata Recommendations to be developed, will facilitate the distribution of content assets from multiple content providers over diverse networks to cable operators to support VoD and other applications at the headend.

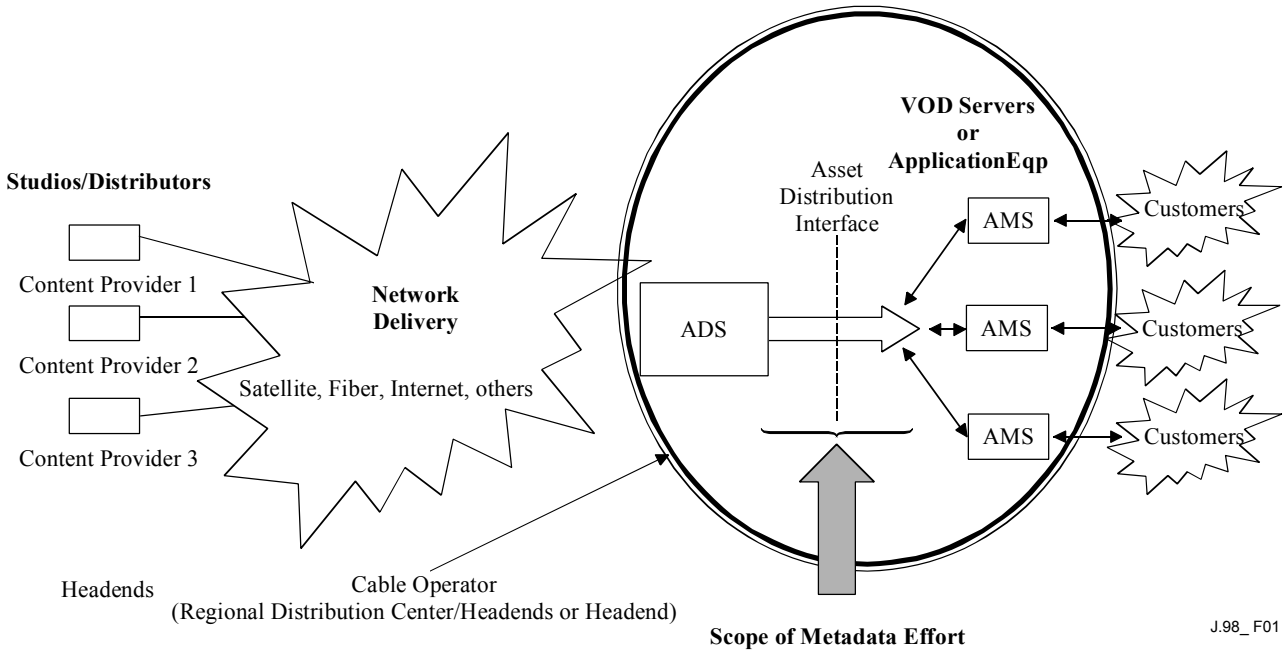

Figure 1/J.98 – Distribution of content assets and scope of metadata effort

The scope of this Recommendation is limited to specific metadata tags and the interfaces that facilitate transfer of metadata and its content assets. This transfer occurs on a network from an independent provider to the cable operator via the Asset Distribution System (ADS) to whatever Asset Management System (AMS) there is residing at the cable operator's headend. This Recommendation provides a common set of metadata used to enable distribution of the content assets to an AMS, as illustrated in Figure 2. At the AMS, application-specific metadata is unwrapped to provide placement and business-rule information of the content assets. Some of the metadata may be reused in customer services, but should provide a filtering mechanism that is at the discretion of the cable operator and application server as indicated in ITU-T Rec. J.97.

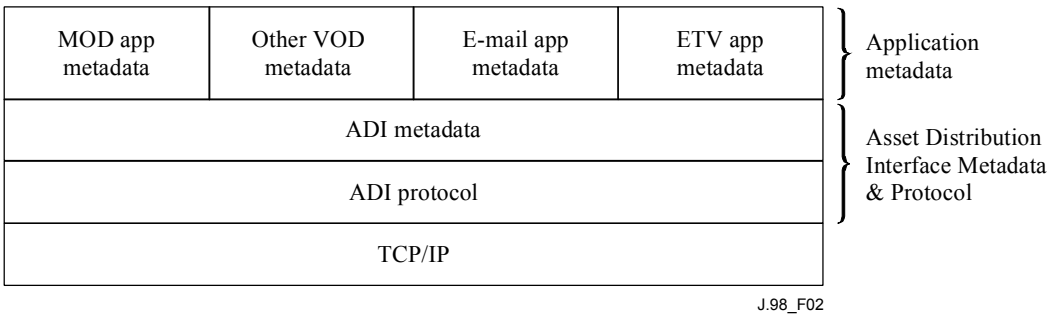

Figure 2/J.98 – Metadata layers

It is important to note that metadata is not a service but enables a service like VoD to be implemented. These requirements define the creation of metadata and how it is handled in the scope of a VoD application.

2 References

The following ITU-T Recommendations and other references contain provisions which, through reference in this text, constitute provisions of this Recommendation. At the time of publication, the editions indicated were valid. All Recommendations and other references are subject to revision; users of this Recommendation are therefore encouraged to investigate the possibility of applying the most recent edition of the Recommendations and other references listed below. A list of the currently valid ITU-T Recommendations is regularly published. The reference to a document within this Recommendation does not give it, as a stand-alone document, the status of a Recommendation.

2.1 Normative references

[1] Extensible Markup Language (XML) 1.0 (Second Edition), W3C Recommendation, 6 October 2000. http://www.w3.org/TR/2000/REC-xml-20001006.

2.2 Informative references

[2] CableLabs Video-on-Demand Content Specification, MD-SP-VOD-CONTENT-I01-020327.

[3] ITU-T Recommendation J.97 (2002), *Metadata on cable networks*.

2.3 Reference acquisition

- Cable Television Laboratories, Inc., 400 Centennial Parkway, Louisville, CO 80027; Phone +1-303-661-9100; Fax +1-303-661-9199; Internet: http://www.cablelabs.com/.
- ITU Telecommunication Standardization Sector, Geneva, Switzerland; Internet: http://www.itu.int/ITU-T/.
- World Wide Web Consortium, Internet: http://www.w3.org/TR/REC-xml.

3 Terms and definitions

This Recommendation defines the following term:

3.1 metadata: Metadata is descriptive data associated with a content asset package or file. It may vary in depth from merely identifying the content package title or information to populate an EPG to providing a complete index of different scenes in a movie or providing business rules detailing how the content package may be displayed, copied, or sold. Separate uses for metadata

have originated from the studios, distribution networks (Cable, Satellite), down to the CPE (STBs, PVRs).

4 Abbreviations and acronyms

This Recommendation uses the following abbreviations:

ADI Asset Distribution Interface

CA Conditional Access

CBR Constant Bit Rate

CPE Customer Premises Equipment

EPG Electronic Programme Guide

MPEG Motion Picture Experts Group

NTSC National Television Systems Committee

SVoD Subscription Video-on-Demand

VoD Video-on-Demand

5 Metadata requirements for video-on-demand

The metadata requirements for VoD are listed in Table 1.

The metadata requirements are divided up into four categories for ease of classification. These categories are:

1) Metadata for filtering/categorizing/display operations (FILT);
2) Metadata for headend operations (OP);
3) Metadata for playback and presentation of asset (PRES);
4) Metadata for business-rule support (BUS).

The following format is used for capturing the metadata requirements from existing specification and member comments.

- **Requirement**

  One or two-line description of the requirement.

- **Additional description (optional)**

  Additional descriptive text which may include examples to clarify the requirement in the form of an example implementation.

- **Phasing**

  If the requirement is not necessary in the initial implementation, a later revision or phase of the Recommendation can be targeted to support this requirement. Phase 1 is defined as supporting existing VoD services in cable networks over MPEG-2 transport.

- **Req/Opt**

  Specifies if it is an optional or mandated requirement to support the phase according to requirements language. This allows for a basic implementation or more advanced features or service offering supported in the same phase based upon the additional optional metadata. The field is determined to be required if at least one of the metadata tags listed is required.

Table 1/J.98 – Metadata matrix of requirements for VoD

Req #	Requirement	Additional description	Phase	Req/ Opt
Current phase				
Metadata for filtering/categorizing/ display operations		Allows for searches, lists, selective delivery, targeting, guides.		
FILT-1	Metadata must support filtering by metadata fields.	E.g., Title, Director, Actors, Bio, Summary, run Time, box office, rental window, etc.	1	Req
FILT-2	Metadata must support Parental Control filters.	This may be done by using MPAA/TV ratings and other advisories assigned to the content.	1	Req
FILT-3	Metadata must support filtering based on availability of assets.	Allows for VoD service to filter VoD content based on time-sensitive factors. Licensing windows are required, but the rest is optional.	1	Req
FILT-4	Metadata should provide necessary information to support display of guides.	To support EPG, VoD guides, title pages, and Cable guides	1	Opt
FILT-5	Metadata should support filtering by genre or category according to an cable operator specific list.	E.g., New releases, Last Chance, action/adventure, Comedy, Drama, Family, Kids, Horror, Thriller, etc.	1	Opt
FILT-6	Metadata may support filtering based on different foreign language-based assets.	E.g., support Spanish, French, Indian films	1	Opt
FILT-7	Metadata may support filtering based on SVoD services.	E.g., search by episodes of TV show	1	Opt
FILT-8	Metadata may support information indicating relationship between different related packages.	SVoD TV episodes, or assets of other interests/indicates if relationship between packages.	1	Opt
FILT-9	Metadata may support listing of material alphabetically, numerically, or chronologically.	Sort lists by numerical, alphabetical or time order	1	Opt
FILT-10	Metadata may support expanded search capabilities based on fields.	Allows for advanced searching based on other fields or combination of categories, e.g., director/actor combos	1	Opt
FILT-11	Metadata should support extensible list of filterable descriptors.	List of example descriptors	1	Opt
Headend operations with metadata		This is information required to run headend operation, maintenance, and reporting tasks.		
OP-1	Cable operators must have capability to inspect, remove, change, or add to received metadata fields.	Allows for verification of metadata at headend, removal of unnecessary or unwanted information at the headend, or addition of cable-specific information	1	Req

Table 1/J.98 – Metadata matrix of requirements for VoD

Req #	Requirement	Additional description	Phase	Req/ Opt
OP-2	Information required for ingestion of package/asset or playback of asset in cable system but not included since a metadata field must have a default value or profile that is used.	E.g., encoding format might not be mentioned in a metadata field but an mpeg-2 encoding profile is the default profile used	1	Req
OP-3	Metadata must indicate grouping of related assets into an asset or package.	This allows for a movie along with its trailer, box cover, & posters to be distributed together as one package from a content provider to headend to VoD server. It also allows for a set of titles to be distributed together as one package.	1	Req
OP-4	Metadata must provide support for ingestion of package/asset into headend and its subsystems.	Indicates where package is to be located and what format it is in	1	Req
OP-5	Metadata must support unique package ID/asset ID, content ID and creation date for each package/asset and may support unique ID down to each instance.	Unique ID to track usage of content and where it is located. This provides interfaces to reporting, billing, and other backend functions.	1	Req
OP-6	Each package/asset must have its own metadata associated with it.	This allows for assets to be recombined into different combinations and packages without losing metadata necessary for each asset. This information could contain description of asset, when it was created, where is can be stored, what are its playback specs, and what are its rights for playing.	1	Req
OP-7	Metadata must support different types of delivery methods for packages/assets to headend.	This supports different types of delivery like tape, satellite, website, IP or automatic/manual input modes.	1	Req
OP-8	Metadata must be able to support separate delivery of metadata and content to the headend and its subsystems.	This allows for metadata-only types of updates via package, staged delivery, or website lookup. This also allows for retransmission of corrupted metadata without retransmitting the MPEG content.	1	Req
OP-9	Metadata must allow for automatic and complete quality checks of assets.	E.g., checks for file corruption: this could be as little as a file size and checksum information. XML parsers can be used to reduce amount of manual QA processing.	1	Req
OP-10	Metadata must allow for asset management within the headend.	This allows for storage allotment checks, cleanup of expired content, etc.	1	Req
OP-11	Metadata must support billing tie-ins to 3rd-party systems.	Metadata that allows content to be tied in to billing and royalty on existing and future 3rd party systems.	1	Req

Table 1/J.98 – Metadata matrix of requirements for VoD

Req #	Requirement	Additional description	Phase	Req/ Opt
OP-12	Recommendations must assist in minimizing proprietary technology used by and within headend for VoD applications and headend VoD Asset management.	This will allow VoD vendors, headend equipment, and content encoders to be interoperable.	1	Req
OP-13	Metadata in headend processes should minimize manual data entry and processing.	This will reduce headend operations and maintenance costs.	1	Opt
OP-14	Metadata should allow for checks to allow for accuracy/completeness of fields including their legal aspects.	E.g., to prevent a movie from being purchased but not playable, to verify playing/purchasing rights are within contract rights. Contracts rights don't have to be mentioned in metadata but should have a reference to it.	1	Opt
OP-15	Metadata should support lifecycle of content.	This should allow for ingestion, renewing, migration, and eventual destruction of package and/or content.	1	Opt
OP-16	Metadata should indicate if content should be delivered in a secure manner.	E.g., this can be done by encrypting the content or by encrypting in the transport layer.	1	Opt
OP-17	Implementations of requirements should consider upgrade paths to implementations of next phase requirements.	Allows Cable Operators to upgrade to Phase 2 headend VoD metadata specifications without unnecessary redesign of headend/VoD equipment.	1	Opt
Metadata related to playback and presentation of asset in VoD service		This is metadata that affects how you see or hear asset.		
PRES-1	Metadata must support an Audio_type and may support multiple tracks of this type.	E.g., Dolby digital in mono, stereo, and surround sound.	1	Req
PRES-2	Metadata must support Preview Asset.	Allows way to preview content.	1	Req
PRES-3	Metadata must support a screen format_type.	E.g., standard, widescreen, letterbox	1	Req
PRES-4	Metadata must support an MPEG-2 encoded video or movie asset.	Allows for suitable playback of VoD movie on existing cable infrastructure	1	Req
PRES-5	Metadata must support at least single CBR encoding rate, but may expand to support multiple CBR/VBR encoding formats and rates as equipment develops.	It has to be a single rate but it could be at different bit rates to accommodate allocated channel resources for a VoD service.	1	Req
PRES-6	Metadata should support "must see" asset option.	Defines which assets must be seen during playout and prevents FF, RWD or skipping of "must see" asset	1	Opt
PRES-7	Metadata may support other types of assets related to package.	This can be an expandable list of other types of assets like related film music videos, insertable commercials, etc.	1	Opt

Table 1/J.98 – Metadata matrix of requirements for VoD

Req #	Requirement	Additional description	Phase	Req/ Opt
PRES-8	Metadata should enable multiple audio language tracks.	Supports a French or Spanish alternate soundtrack	1	Opt
PRES-9	Metadata should support alternate audio tracks.	Supports surround sound in addition to stereo, director's voiceovers to soundtracks, etc.	1	Opt
PRES-10	Metadata should support graphical assets.	Poster, Box Cover	1	Opt
PRES-11	Metadata may support foreign language UI interfaces.	Allows for different language UI interfaces	1	Opt
PRES-12	Metadata should support subtitle options.		1	Opt
PRES-13	Metadata should inform whether closed captioning option exists for content.		1	Opt
PRES-14	Metadata may support VoD features based upon indexing of content.	Could support DVD functionalities or other implementations requiring an indexing of content	1	Opt
Metadata business rule requirements		Metadata related to business aspects		
BUS-1	Cable operator must have the capability to filter and remove business-related metadata from informational metadata for packages given by the content provider or distributor.	This allows cable operators to use information sent separately from the received metadata for their business systems. It allows a way to flexibly adjust prices apart from the one-time price indicated by the metadata transferred with the content.	1	Req
BUS-2	Metadata may support financial/revenue/royalty information.	This provides information for royalties, flat fees from studio, distributor, or cable operator to allow for quick ingestion of VoD package.	1	Opt
BUS-3	Metadata specification should be useable internationally.	Specification can be used in different countries.	1	Opt
BUS-4	Metadata should support itemized billing statements.	Customer gets a list of movies he purchased for a month with option of not listing adult content.	1	Opt
BUS-5	Metadata should indicate at what point a played asset is purchased.	To prevent previewing of whole movie without purchasing it	1	Opt
BUS-6	Metadata should support rights on purchase viewing.	Makes sure any reconfigurable services do not violate rights file. This may be a conditional access, link security, or content security.	1	Opt
BUS-7	Metadata may support feature film content ratio based on language, country of origin, language and ethnicity.	E.g., verify that content offered meets CRTC film ratios	1	Opt

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