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Digital Video Subcommittee

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Content Metadata

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1. Introduction

1.1. Executive Summary

This standard defines the metadata typically required when a provider delivers on demand content to a distributor.

1.2. Scope

This standard describes the grammar needed to represent information pertinent to the distribution, presentation and consumption of multimedia content. In a normal use case, the metadata originates from a provider and is distributed to operators.

A set of files referenced in this document contains the XML Schema definition that *may* be used to validate XML documents purported to conform to this specification. This specification and accompanying XML Schema documents are the Point of Authority for compliance.

1.3. Intended Audience

This standard is written for providers and consumers of content and metadata. It can be used to acquire Live to On Demand content or file based On Demand content. It can also be used for guide data information.

1.4. Areas for Further Investigation or to be Added in Future Versions

It may be useful in the future to look at other metadata standards and attempt to unify key names and definitions. Some examples include EIDR, Schema.org and Movielabs metadata standards and specifications.

2. Normative References

The following documents contain provisions, which, through reference in this text, constitute provisions of this document. At the time of Subcommittee approval, the editions indicated were valid. All documents are subject to revision; and while parties to any agreement based on this document are encouraged to investigate the possibility of applying the most recent editions of the documents listed below, they are reminded that newer editions of those documents might not be compatible with the referenced version.

2.1. SCTE References

- | | |
|-----------|--|
| [SCTE 35] | SCTE 35 2016, Digital Program Insertion Cueing Message for Cable, Society of Cable Telecommunications Engineers (SCTE), 2016. (Also standardized as ITU-T Recommendation J.181). |
|-----------|--|

2.2. Standards from Other Organizations

- | | |
|---------------|--|
| [IETF BCP 47] | IETF BCP 47, Tags for Identifying Languages, 2009, Internet Engineering Task Force. |
| [ISO 3166] | International Organization for Standardization, ISO 3166-1:2006. Code for the representation of names of countries and their subdivisions – Part 1: Country codes. |
| [ISO 4217] | International Organization for Standardization, ISO 4217:2008. Codes for the representation of currencies and funds. |
| [RFC 1034] | IETF RFC 1034, Domain names - concepts and facilities. P.V. Mockapetris. November 1987. |

[RFC 3986]	IETF RFC 3986, Uniform Resource Identifier (URI): Generic Syntax. T. Berners-Lee, R. Fielding, L. Masinter. January 2005.
[XML InfoSet]	W3C Recommendation, "XML InfoSet (Second Edition)", John Cowan, Richard Tobin, 4 February 2004, http://www.w3.org/TR/2004/REC-xml-infoset-20040204/ .
[XML Namespaces]	W3C Recommendation, "Namespaces In XML (Second Edition)", Tim Bray, et al, 16 August 2006, http://www.w3.org/TR/2006/REC-xml-names-20060816/ .
[XML SchemaP1]	W3C Recommendation, "XML Schema Part 1: Structures (Second Edition)", H. Thompson, et al, 28 October 2004, http://www.w3.org/TR/xmlschema-1/ .
[XML SchemaP2]	W3C Recommendation, "XML Schema Part 2: Datatypes (Second Edition)", P. Biron, et al, 28 October 2004, http://www.w3c.org/TR/xmlschema-2/ .
[XML]	W3C REC: eXtensible Markup Language (XML) 1.1, February 4, 2004.

2.3. Published Materials

- No normative references are applicable.

3. Informative References

The following documents might provide valuable information to the reader but are not required when complying with this document.

3.1. SCTE References

- No informative references are applicable.

3.2. Standards from Other Organizations

[ADI1.1]	CableLabs Asset Distribution Interface Specification Version 1.1, MD-SP-ADI1.1-C01-120803, August 3, 2012, Cable Television Laboratories, Inc.
[Ad-ID]	Ad-ID Structure, https://www.ad-id.org/help/structure.cfm
[Content1.1]	CableLabs Video-on-Demand Content Specification Version 1.1, MD-SP-VOD-CONTENT1.1-C01-120803, August 3, 2012, Cable Television Laboratories, Inc.
[EIDR]	EIDR ID Format can be found at: http://www.eidr.org
[GENRES]	Genres list can be found at: https://www.ctam.com/Media/Glossary/On-Demand-Genre-and-Show-Type-Requirements.pdf
[IEC 13818-6]	ISO/IEC 13818-6: 1998(E) Information Technology- generic Coding of Moving Pictures and Associated Audio Information – Part 6: Extensions for DSM-CC.
[ISAN]	ISAN User Guide, http://www.isan.org/docs/isan_user_guide.pdf
[ISRC]	International Standard Recording Code (ISRC) FAQ: http://www.riaa.com/issues/audio/isrc_faq.asp
[MPAA]	Motion Picture Association of America Ratings, http://www.mpa.org/ratings
[TV]	TV Parental Guidelines, http://www.tvguidelines.org/ratings.htm
[CEP3.0]	Content Encoding Profiles 3.0 Specification, OC-SP-CEP3.0-I05-151104, November 4, 2015, Cable Television Laboratories, Inc.

3.3. Published Materials

- No informative references are applicable.

4. Compliance Notation

<i>shall</i>	This word or the adjective “ <i>required</i> ” means that the item is an absolute requirement of this document.
<i>shall not</i>	This phrase means that the item is an absolute prohibition of this document.
<i>forbidden</i>	This word means the value specified shall never be used.
<i>should</i>	This word or the adjective “ <i>recommended</i> ” means that there may exist valid reasons in particular circumstances to ignore this item, but the full implications should be understood and the case carefully weighted before choosing a different course.
<i>should not</i>	This phrase means that there may exist valid reasons in particular circumstances when the listed behavior is acceptable or even useful, but the full implications should be understood and the case carefully weighed before implementing any behavior described with this label.
<i>may</i>	This word or the adjective “ <i>optional</i> ” means that this item is truly optional. One vendor may choose to include the item because a particular marketplace requires it or because it enhances the product, for example; another vendor may omit the same item.
<i>deprecated</i>	Use is permissible for legacy purposes only. Deprecated features may be removed from future versions of this document. Implementations should avoid use of deprecated features.

5. Abbreviations and Definitions

5.1. Abbreviations

AMS	Asset Management System
APS	Analog Protection System
CA	Content Asset
CGMS_A	Copy Generation Management System - Analog
CIT	Constrained Image Trigger
EMI	Encryption Mode Indicator
EPG	Electronic Program Guide
HD	High Definition
ID	Identifier
MPAA	Motion Picture Association of America
MSO	Multiple System Operator
NPT	Normal Playback Time
PO	Placement Opportunity
SD	Standard Definition
STB	Set-Top Box
SVOD	Subscription Video-on-Demand
TBD	To Be Determined
TV	Television

UI	User Interface
URI	Uniform Resource Identifier
URL	Uniform Resource Locator
VOD	Video-on-Demand
XML	Extensible Markup Language

5.2. Definitions

Asset	A combination of content and associated metadata, except for a Content Asset, which includes only metadata, and that directly or indirectly refers to content. An Asset <i>may</i> be an abstract container of references to other Assets with metadata that applies to all of the referenced Assets.
Asset Distribution Interface	The means by which assets (content as well as metadata describing that content) are transported from a provider to an Asset Management System. In addition, it provides a mechanism by which ‘block’ updates <i>may</i> be made to previously distributed assets. These block updates include metadata replacement, adding a new child asset to a previously received asset and deleting an asset.
Asset Distribution System	Provides transportation of Assets from the premises of the Assets’ provider to the premises of the MSO. It interfaces to the Asset Management System using the Asset Distribution Interface (ADI).
Asset Management System	An entity that stores and manages the lifecycle of Assets.
Content	Audio, video, or still picture creative materials used to form a movie, preview, poster art, etc. file (e.g., MPEG-encoded movie).
Content Asset	A specific type of Asset which is only metadata and which includes a reference to content.
Metadata	Descriptive data included in an Asset or Content Asset.. It <i>may</i> vary in depth from merely identifying the asset or information to populate an EPG to providing a complex index of different scenes in a movie or providing business rules detailing how the content <i>may</i> be displayed, copied or sold. Separate uses for metadata have originated from the studios, distribution networks (Cable, Satellite), down to the CPE (STBs, PVRs).
Provider	A Party responsible for allocating asset identifiers.

6. Overview

This specification defines the metadata content assets that are used to distribute a content metadata from a Provider to a number of cable operators.

6.1. Data Model

The essential conceptual object in the Metadata 3.0 data model is an Asset. An asset represents the basic amount of information that all other metadata types *should* contain.

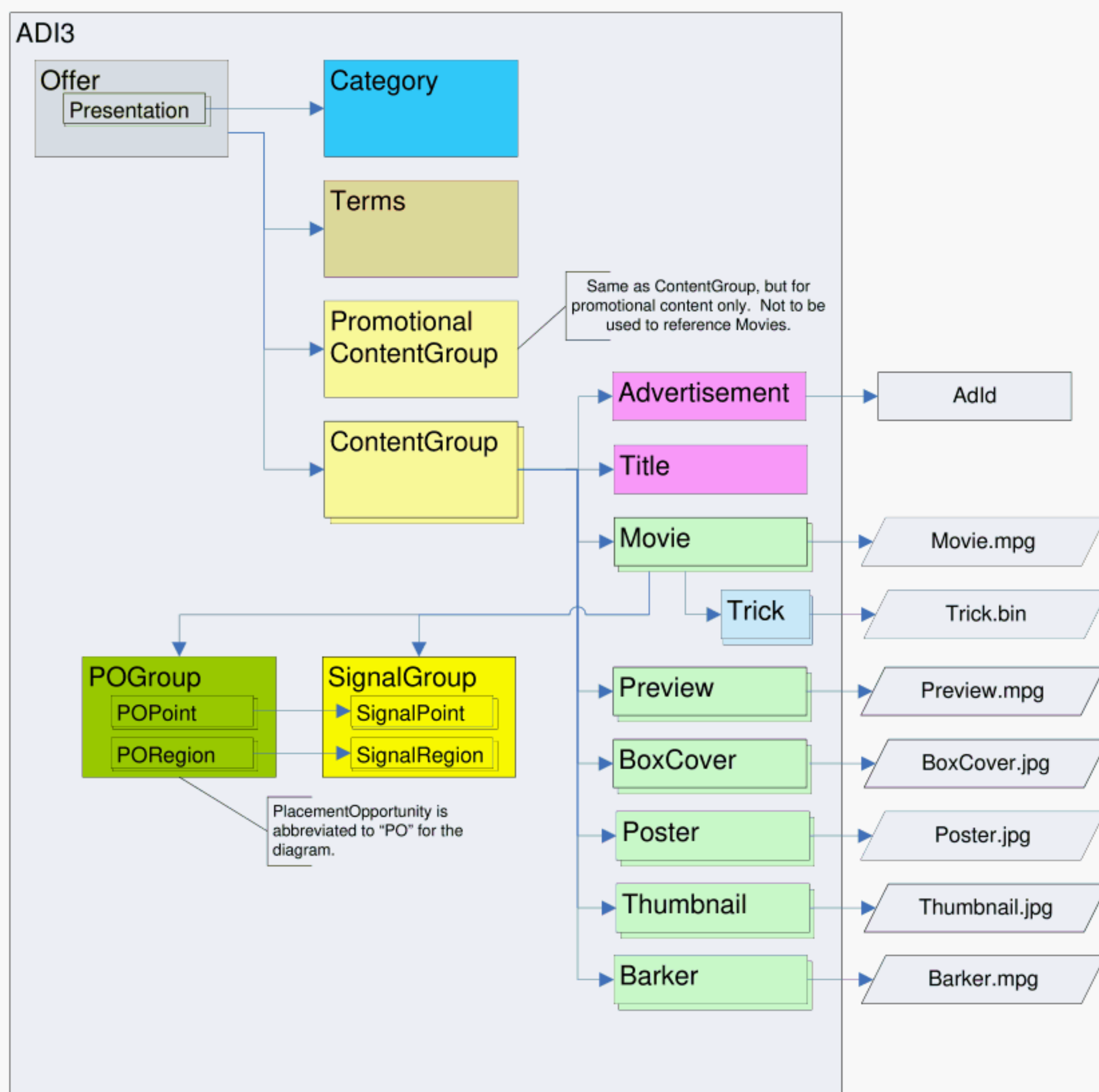


Figure 1 - Asset Relationships

6.1.1. Offer

An Offer is the structure used to assemble related content, title information, and terms for presentation to a customer. It will include all of the necessary information to sell content to a customer. This *may* include a single movie, a grouping of television programs, trilogies, or combinations of any sort. This model *may* be extended in the future to define offerings of mixed media.

An offer will include one or more content groups plus a single promotional content group. The promotional content group refers to content (title, previews, images, etc.) that *may* be used to present and sell the offer to a customer. Sometimes the promotional content for a combination (e.g., movie trilogy, TV season) will be different than for any single movie or program content group. In a simple case, the promotional content and included content will reference the same content group.

6.1.2. Terms

Pricing, content restrictions, and royalty information are bundled together to create a set of Terms. These terms represent the business agreements that accompany an offer and *may* be reused in more than one offer. The terms apply to all of the content included with the offer.

6.1.3. Category

A Category defines a set of category paths that are used for presentation in a VOD menu system.

6.1.4. ContentGroup

A ContentGroup is a combination of all of the related content (movies, previews, images, etc.) with its Title metadata. A Title is presumed to always be included and at least one form of content. Groupings of content *may* be reused by combining them with terms to create different offers.

A ContentGroup *may* contain multiple types of content or multiple versions of the same content. For example, a content group could contain metadata for both the standard and HD version of the same movie, if the two are interchangeable and can be represented by the same set of terms in the referencing offer.

6.1.5. Title

The Title defines the descriptive metadata for a movie or set of movies (or programs). This *may* be information that is used for actual display on the user's screen (e.g., Name of the movie, Actors), or *may* be used in the VOD system for classification or display constraints (e.g., Rating). Titles *may* be shared between different content groups, but only one title will be associated with a given content group.

6.1.6. ContentAsset

ContentAsset is the metadata asset that represents the actual content files distributed to the end system.

6.1.6.1. AudioVideo ContentAsset

This category of ContentAsset includes Movies, Previews, and Barkers. A Movie is the actual audio video content that's being offered to the user and is subject to the terms referenced in the offer. A Preview is an audio video promotion for the same movie, but is assumed to not be subject to the price expressed in the terms unless otherwise agreed. Note that a Movie can actually be any type of audio video content where the terms apply (e.g., TV program, pre-recorded event, etc.).

A Barker is a form of promotional content that is typically played in a continuous loop. It is usually not associated with a single Movie, but is provided in a separate content group for a particular category of content.

6.1.6.2. StillImage ContentAsset

The Still Image ContentAsset category includes Posters, BoxCovers, and Thumbnails that *may* be used to promote a Movie. It is often used as part of a user-selection screen in a VOD menu or EPG.

6.1.6.3. Trick ContentAsset

A Trick is a special type of ContentAsset that is associated with a Movie or Preview and includes pre-processed images to display during fast forward or rewind operations.

6.1.6.4. Extending the model with new ContentAssets

The ContentGroup *may* be extended to include new types of content that are not currently anticipated in this specification.

6.1.7. Advertisement

An Advertisement is a specialized form of a Title asset that includes a reference to the Ad-ID schema for expressing metadata specific to ads. An Advertisement *may* be used in place of a Title in the ContentGroup if the corresponding content is indeed an ad.

6.1.8. SignalGroup

A SignalGroup is a collection of SignalPoints and/or SignalRegions. Signals are points or regions, constrained by 2 points of interest, and are essentially identified time indexes related to a video asset.

Signal metadata *may* contain additional information about how it was acquired from a corresponding in-band signal. Signal point positions within an asset *may* be based on a fixed time index and/or contain data to support association with an in-band signal.

6.1.9. PlacementOpportunityGroup

A PlacementOpportunityGroup is a collection of PlacementOpportunityPoints and PlacementOpportunityRegions along with an expression of various rules regarding the placement opportunity. The points and regions will typically correspond with Signal points and regions associated with the video content.

6.2. Specification Components

This specification consists of the following elements:

1. This specification document, which is normative except as otherwise noted.
2. The associated XML schema files are listed in the table below and are normative.

Table 1 - Normative Schema Files

Schema File Name	Namespace
SCTE236-AD.xsd	http://www.scte.org/schemas/236/2017/ad
SCTE236-CONTENT.xsd	http://www.scte.org/schemas/236/2017/content
SCTE236-CORE.xsd	http://www.scte.org/schemas/236/2017/core
SCTE236-OFFER.xsd	http://www.scte.org/schemas/236/2017/offer
SCTE236-PLACEMENTOPPORTUNITY.xsd	http://www.scte.org/schemas/236/2017/placementopportunity
SCTE236-SIGNALING.xsd	http://www.scte.org/schemas/236/2017/signaling
SCTE236-TERMS.xsd	http://www.scte.org/schemas/236/2017/terms
SCTE236-TITLE.xsd	http://www.scte.org/schemas/236/2017/title

7. XML Conventions

This document relies heavily on normative XML schemas to complete this 3.0 specification. Several common conventions are employed in the creation of the schemas and definition of the data model.

7.1. Normative XML Schemas

The messages, elements, and attributes that make up this specification are not explicitly defined in this document. The normative XML schemas (located at http://www.scte.org/schemas/236/2017/SCTE236*.xsd) comprise the full normative specification.

No messages representing the interfaces defined in the schema are considered conformant unless they are valid according to the schema documents. In the case where the written normative specification and the normative schema document conflict, the XML schema documents *shall* take precedence. Furthermore, there are additional requirements described in the schema annotations that are not enforceable by schema validation mechanisms. These requirements *shall* also be strictly observed.

The inclusion of a normative XML schema document does not require or imply the specific use of the schema nor a requirement that a message be validated.

7.2. XML Namespaces

Each of the schemas included with this specification has a unique namespace. Table 2 lists the namespaces, recommended prefixes, and a description along with the major types defined.

Table 2 - XML Namespace Declarations

Prefix	Namespace	Description
ad	http://www.scte.org/schemas/236/2017/ad	
content	http://www.scte.org/schemas/236/2017/content	Provides all of the known content types
core	http://www.scte.org/schemas/236/2017/core	Provides the base AssetType and AssetRefType
offer	http://www.scte.org/schemas/236/2017/offer	Provides OfferType, CategoryType and ContentGroupType
placement opportunity	http://www.scte.org/schemas/236/2017/placementopportunity	
signaling	http://www.scte.org/schemas/236/2017/signalling	
terms	http://www.scte.org/schemas/236/2017/terms	Provides TermsType
title	http://www.scte.org/schemas/236/2017/title	Provides TitleType
xml	http://www.w3.org/XML/1998/namespace	Used for xml:lang attribute
xsd	http://www.w3.org/2001/XMLSchema	XML foundation. See [XML SchemaP1], [XML SchemaP2]
xsi	http://www.w3.org/2001/XMLSchema-instance	

7.3. Unknown/Unrecognized/Unsupported XML Elements and Attributes

Generally, unknown, unrecognized, or unsupported XML elements and attributes contained within Core Metadata messages and elements *should* be ignored during message processing. Specifically, these are elements or attributes that the implementation does not understand or expect.

7.4. Element Order

Element order is constrained by the schema and *shall* be preserved throughout processing of the XML document. In particular, the order of elements affects the end result of the processing. Consequently, an implementation failing to preserve the order *may* cause incorrect processing results. Subsequently, the process of producing an abstract XML Information Set (InfoSet) from a concrete XML document, e.g., by parsing it, *shall* always result in the same abstract InfoSet, with the same element order per XML InfoSet

(see [XML InfoSet] for additional information). Any intermediary processing *may* enhance the XML document, but it **shall not** alter the abstract InfoSet element order (i.e., the XML elements comprising the document **shall** stay in document order).

7.5. XML Encoding

When generating a new XML Document to this specification, a standard encoding **shall** be properly expressed in the XML declaration. The actual encoding *should* be “ISO-8859-1” to provide the best compatibility with existing systems. However, the XML Document *may* use any well-known encoding, provided targeted downstream components have been properly tested. The following example shows the XML Declaration:

```
<?xml version="1.0" encoding="ISO-8859-1"?>
```

7.6. Language Identification

In document processing, it is often useful to identify the natural or formal language in which the content is written. A special attribute named `xml:lang` *may* be inserted in documents to specify the language used in the contents and attribute values of any element in an XML document. See [XML] for the allowed values. Typically, the `xml:lang` attribute is utilized with an `xsd:string` type.

7.7. Deprecated Elements

There are several cases where elements are defined in the schemas that are intended to be deprecated. These elements are provided for easy backward compatibility with [ADI1.1]. In these cases, the element is defined with a required Boolean **deprecated** attribute, which **shall** always be present and always be set to *true*. The following example illustrates a deprecated element in an instance document:

```
<Provider deprecated="true">CableLabs</Provider>
```

The deprecated attribute is reserved and **shall not** be used for any other purpose in any extension to this specification. Also, it is not necessary and highly discouraged to include the deprecated attribute on an element when the value is false (not deprecated).

7.8. Extensibility

The base asset type defined in the Core namespace includes an `Ext` element, which allows any content (elements or attributes) from any namespace to be included. This makes it easy to extend or customize an asset in a predictable manner while enabling filters or transforms to be applied. Any consumer of XML documents following this specification can safely ignore contents of the `Ext` element unless they otherwise have an agreement with the XML document producer. There is no requirement by this specification that the contents of the `Ext` element be validated, regardless of whether a namespace is provided. The following example illustrates how the `Ext` element is used:

```
<Ext isAwesome="true" meaningOfLife="42">
  <!-- Could refer to a remote namespace -->
  <Color xmlns=https://www.awesome-provider.com/colors/>Red</Color>
  <!-- Could also look like an ADI 1.1 trial use field -->
  <App_Data app="MOD" name="color" value="blue" />
</Ext>
```

Information routinely added to the `Ext` element could provide the groundwork for future permanent additions to this specification. However, new elements or attributes defined by future revisions to this specification will not be placed within the `Ext` element.

7.9. Enumerated Values

Enumerations are defined as XML schema enumerations only in cases where the set of possible values is strongly believed to be fixed. In several cases, enumerations are actually defined as an XML schema pattern, which provides a set of known standard values and allows private extensibility. To extend this type of enumeration, the value *shall* be prefixed with the string “private”, indicating that this is a non-standard value and *may* be ignored or handled in a different way. An example of both a standard and non-standard enumerated value is:

```
<Audience>Children</Audience>
```

```
<Audience>private:Toddler</Audience>
```

7.10. Required Elements

There are several elements that are not explicitly required by the XML Schemas, but are nevertheless required to be provided for any conformant document that originated as per this specification. These elements are optional to allow conversion from ADI 1.1 documents, but *shall* be provided for all new documents. These cases are annotated appropriately in the XML Schema.

7.11. Qualified Values

There are several cases in the specification where the value of an element requires additional context to define the set of possible values. In these cases, it is required to provide the scheme from which the value is provided. The attributes described in this section are accompanied with a preliminary list of schemes. The value of the attribute is not confined to the list, but it *should* be well understood by all parties consuming the XML.

7.11.1. *identifierSystem Attribute*

- **VOD 1.1** - To preserve compatibility with ADI 1.1 documents, an alternate identifier is provided to deterministically map to the ADI 1.1 ProviderID / AssetID. It *shall* be provided in the following format: vod://{ProviderID}/{AssetID} and follow all the rules for Provider ID and Asset ID set forth in [ADI1.1].
- **EIDR** – Identifiers using this system *shall* satisfy all of the requirements for the canonical form of an identifier specified at [EIDR].
- **ISAN** - Identifiers using this system *shall* satisfy all of the requirements for an identifier specified at [ISAN].
- **Ad-ID** - Identifiers using this system *shall* satisfy all of the requirements for an identifier specified at [Ad-ID].
- **ISCI** - Identifiers using this system *shall* be recognizable as an Industry Standard Commercial Identifier.
- **ISRC** - Identifiers using this system *shall* satisfy all of the requirements for an identifier specified at [ISRC].

7.11.2. *ratingSystem Attribute*

- **MPAA** - Includes ratings from [MPAA].
- **TV** - Includes ratings from [TV]. See guidelines for this rating system in Appendix I.4.
- **MSO** - Includes ratings specific to the target MSO. There is no predefined set or format for MSO ratings. They *should* be customized by the metadata creator to the expectations of the target MSO.

7.9. Enumerated Values

Enumerations are defined as XML schema enumerations only in cases where the set of possible values is strongly believed to be fixed. In several cases, enumerations are actually defined as an XML schema pattern, which provides a set of known standard values and allows private extensibility. To extend this type of enumeration, the value *shall* be prefixed with the string “private”, indicating that this is a non-standard value and *may* be ignored or handled in a different way. An example of both a standard and non-standard enumerated value is:

```
<Audience>Children</Audience>
```

```
<Audience>private:Toddler</Audience>
```

7.10. Required Elements

There are several elements that are not explicitly required by the XML Schemas, but are nevertheless required to be provided for any conformant document that originated as per this specification. These elements are optional to allow conversion from ADI 1.1 documents, but *shall* be provided for all new documents. These cases are annotated appropriately in the XML Schema.

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- **EIDR** – Identifiers using this system *shall* satisfy all of the requirements for the canonical form of an identifier specified at [EIDR].
- **ISAN** - Identifiers using this system *shall* satisfy all of the requirements for an identifier specified at [ISAN].
- **Ad-ID** - Identifiers using this system *shall* satisfy all of the requirements for an identifier specified at [Ad-ID].
- **ISCI** - Identifiers using this system *shall* be recognizable as an Industry Standard Commercial Identifier.
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