

SMPTE STANDARD

Metadata Groups Register



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Foreword

SMPTE (the Society of Motion Picture and Television Engineers) is an internationally-recognized standards developing organization. Headquartered and incorporated in the United States of America, SMPTE has members in over 80 countries on six continents. SMPTE's Engineering Documents, including Standards, Recommended Practices, and Engineering Guidelines, are prepared by SMPTE's Technology Committees. Participation in these Committees is open to all with a bona fide interest in their work. SMPTE cooperates closely with other standards-developing organizations, including ISO, IEC and ITU.

SMPTE Engineering Documents are drafted in accordance with the rules given in its Standards Operations Manual.

SMPTE ST 395 was prepared by Technology Committee 30MR.

Intellectual Property

At the time of publication no notice had been received by SMPTE claiming patent rights essential to the implementation of this Engineering Document. However, attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. SMPTE shall not be held responsible for identifying any or all such patent rights.

1 Scope

The metadata groups register defined in this standard covers the use of metadata for all types of essence (picture, sound, data in their various forms). Applications of individual register entries will vary but, when used, shall conform to the definitions and formats in this metadata groups register standard.

The metadata groups register defines groups of metadata elements for the exchange of information in all kinds of groups (sets and packs) defined by SMPTE ST 336, Section 6.

This standard also defines the information elements that appear in XML encoded instances the metadata groups register.

2 Conformance Notation

Normative text is text that describes elements of the design that are indispensable or contains the conformance language keywords: "shall", "should", or "may". Informative text is text that is potentially helpful to the user, but not indispensable, and can be removed, changed, or added editorially without affecting interoperability. Informative text does not contain any conformance keywords.

All text in this document is, by default, normative, except: the Introduction, any section explicitly labeled as "Informative" or individual paragraphs that start with "Note:"

The keywords "shall" and "shall not" indicate requirements strictly to be followed in order to conform to the document and from which no deviation is permitted.

The keywords, "should" and "should not" indicate that, among several possibilities, one is recommended as particularly suitable, without mentioning or excluding others; or that a certain course of action is preferred but not necessarily required; or that (in the negative form) a certain possibility or course of action is deprecated but not prohibited.

The keywords "may" and "need not" indicate courses of action permissible within the limits of the document.

The keyword "reserved" indicates a provision that is not defined at this time, shall not be used, and may be defined in the future. The keyword "forbidden" indicates "reserved" and in addition indicates that the provision will never be defined in the future.

A conformant implementation according to this document is one that includes all mandatory provisions ("shall") and, if implemented, all recommended provisions ("should") as described. A conformant implementation need not implement optional provisions ("may") and need not implement them as described.

Unless otherwise specified, the order of precedence of the types of normative information in this document shall be as follows: Normative prose shall be the authoritative definition; Tables shall be next; followed by formal languages; then figures; and then any other language forms.

3 Normative References

Note: All references in this document to other SMPTE documents use the current numbering style (e.g. SMPTE ST 298:2009) although, during a transitional phase, the document as published (printed or PDF) may bear an older designation (such as SMPTE 298-2009). Documents with the same root number (e.g. 395) and publication year (e.g. 2009) are functionally identical.

The following standards contain provisions that, through reference in this text, constitute provisions of this recommended practice. At the time of publication, the editions indicated were valid. All standards are subject

to revision, and parties to agreements based on this recommended practice are encouraged to investigate the possibility of applying the most recent edition of the standards indicated below.

SMPTE ST 298-2009, Universal Labels for Unique Identification of Digital Data

SMPTE ST 336-2007, Data Encoding Protocol Using Key-Length-Value

SMPTE ST 2029:2009, Uniform Resource Names for SMPTE Resources

W3C Recommendation – Namespaces in XML, World Wide Web Consortium, 14-January-1999.
<http://www.w3.org/TR/REC-xml-names/>

Uniform Resource Name Syntax – <http://www.ietf.org/rfc/rfc2141.txt>

A URN Namespace of Object Identifiers – <http://www.ietf.org/rfc/rfc3061.txt>

XML Schema Part 1: Structures Second Edition, W3C Recommendation 28 October 2004,
<http://www.w3.org/TR/2004/REC-xmlschema-1-20041028/>

XML Schema Part 2: Datatypes Second Edition, W3C Recommendation 28 October 2004,
<http://www.w3.org/TR/2004/REC-xmlschema-2-20041028/>

4 Metadata Groups Register Structure

4.1 Overview (Informative)

The metadata groups register structure provides flexibility in capturing metadata and exchanging it among applications through a standardized hierarchy of universal labels and through standardized symbol names for the metadata groups, organized to aid their management within a small but comprehensive number of classes. Metadata group classes are collections of metadata groups with common characteristics or attributes. Additional classes are provided for user-defined metadata.

The metadata groups register references individual items or elements of metadata groups using a two-part 16-byte Universal label that is numerical (and hence language independent) and unique. The first 8 bytes identify the second as an item designator in a specific version of a designated metadata dictionary, such as the one defined by SMPTE ST 335. This item designator is used to index the meaning or definition of the metadata element.

The KLV coding of groups of metadata items is defined in SMPTE ST 336; different kinds of KLV group encodings include universal, global, and local sets, defined-length and variable-length packs.

The first 8 bytes of the 16-byte KLV group key are the universal label (UL) header (or designator) and are defined in clause 4.1 and tables 2 and 3 of SMPTE ST 336. The metadata groups register defined by this standard specifies the contents of bytes 6-8 of the metadata universal set UL header and designator (see Section 4.5.4):

- Byte 6 (registry designator);

Note: In KLV encoding, this byte identifies the set or pack syntax used in a given instance of a metadata group. This may be universal or global set, several variants of local set (with different tag field width and length field width), fixed pack, and variable pack (with variants of length field width).

- Byte 7 (structure designator);
- Byte 8 (version number).

All allowable KLV encoding syntaxes for a given group are defined by the same entry in the metadata groups register (see Section 4.5.14).

Note: Universal and global and sets use a lossless form of KLV encoding of the ULs of each data item in the set and hence can losslessly map the data items to the appropriate dictionary. KLV sets do not require any specific ordering of the elements, and also allow some elements to be optional (i.e.; not present). KLV packs require that the elements are presented in a specific order, and all the elements must be present (although in a variable pack, some may have zero length).

4.2 Compatibility with Other Metadata Structures (Informative)

The metadata groups register structure is a framework that supports global interoperability by defining metadata tags in a way that enables the interchange of SMPTE metadata with metadata from different sources and originated by other bodies.

Many different cataloging conventions are used by communities who focus on a specific domain or subject or who have specific needs for archive and retrieval of multimedia data including, for example, intellectual rights. The metadata groups register is not intended to replace conventions already in use, for example, in textual naming or key words. Within the framework of the metadata groups register structure, different content creation communities, media indexing professionals, or metadata extractors and users can develop metadata conventions that meet their specific requirements.

4.3 Individual Classes of Metadata Groups

Metadata groups may contain metadata items from one or from many classes in the SMPTE ST 335 metadata dictionary. Mandatory and optional items in each group are listed in the groups register entries (see below).

Within the metadata groups register, metadata groups are organized into a hierarchical structure, where each is assigned to a metadata group class, as shown in the overview of figure 1, based upon the primary role of the group or the class of the primary metadata in the group or both. The list of metadata group classes defined by this standard consists of:

- Class 1: Identification and location
- Class 2: Administrative
- Class 3: Interpretive
- Class 6: Relational
- Class 7: Spatio-temporal
- Class 12: Compound
- Class 13: Organizationally registered for public use
- Class 14: Organizationally registered as private
- Class 15: Experimental

This list mirrors the classes defined by SMPTE ST 335 and adds the compound class (class 12) to cover groups constructed from diverse metadata components.

The number of metadata classes may be extended in the future to a maximum of 127.

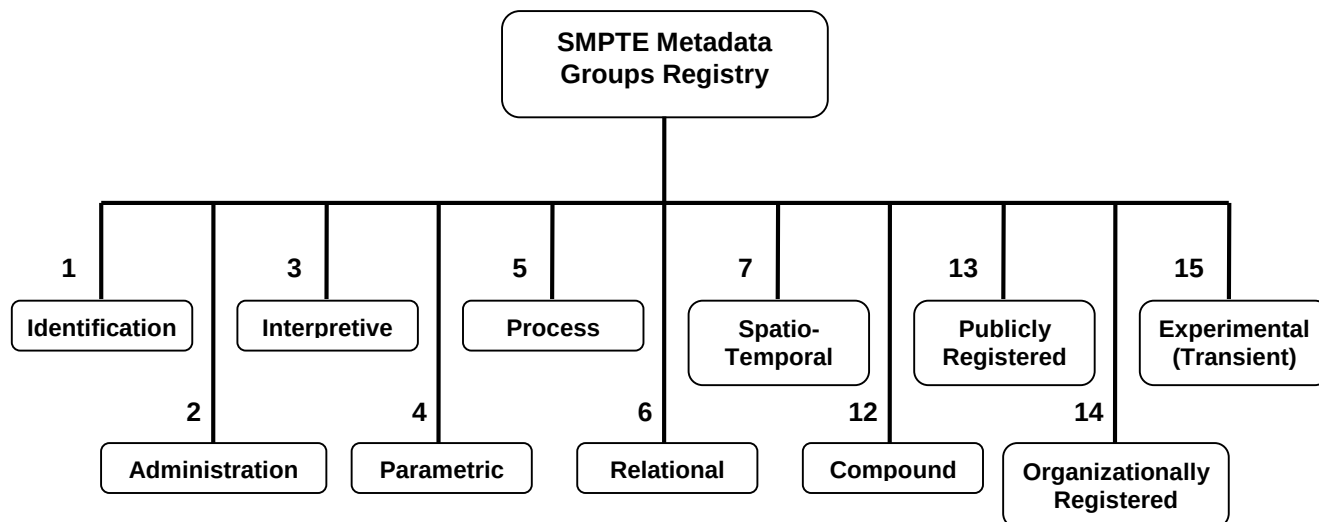


Figure 1 – Overview of groups register classes

4.3.1 Class 1: Identification and Location

Metadata Groups in this class shall primarily carry identifying information (IDs) that describes the essence of the overall bit stream or file. A critical part of Class 1 metadata is unambiguous identification of the essence using a single, recognized number or label such as the SMPTE Unique Material Identifier (SMPTE ST 330). Information in this Class shall include global and local identifiers as well as identifying information about the metadata elements themselves (so-called “meta-metadata”). Examples of sub-class titles in this Class are:

- Globally unique identifiers
- ISO identifiers
- Object identifiers
- Device identifiers
- Unique IPR identifiers
- Local locators
- Titles

4.3.2 Class 2: Administration

Metadata groups in this class shall primarily carry administrative or business data that describes information about the essence or metadata that is relevant to its application. Information on authorized use, restrictions on use, and encryption are in this metadata class. Cost information and information needed to protect intellectual property or to protect ownership shall also be contained in Class 2. Examples of sub-class titles in this class are:

- Supplier
- Rights
- Financial information
- Security
- Publication outlet
- Participating parties
- Broadcast and repeat statistics

4.3.3 Class 3: Interpretive

Metadata groups in this class shall primarily carry information which is normally considered either a subjective or a human-generated description of the essence or a computational result from machine examination of the essence. Interpretive information shall consist of, but not be limited to, textual terms (e.g.; keywords, narrative summary, titles, genre categories, scripts, etc.), or computational metrics (e.g.; color histograms, texture maps, object shapes, facial features, etc.). Information in Class 3 shall be principally used for indexing, cataloging, administering, searching, and retrieving the content of essence. Examples of sub-class titles in this class are:

- Fundamental (such as ISO language code, length, and time systems)
- Descriptive (human-assigned)
- Categorization
- Assessments
- Descriptors (machine-assigned or computed)

4.3.4 Class 4: Parametric

Metadata groups in this class shall primarily carry information that describes the technical characteristics of the camera, sensor, or system that originates the essence or metadata. Information about the technical characteristics of the essence or metadata is also provided, including, but not limited to, its creation parameters and the configuration of the originating system. Examples of sub-class titles in this class are:

- Video essence encoding characteristics
- Audio essence encoding characteristics
- Data essence encoding characteristics
- Metadata encoding characteristics
- Audio test parameters
- Film pulldown characteristics
- Fundamental sequencing and scanning
- MPEG coding characteristics
- Time code characteristics