

SMPTE STANDARD

Metadata Element
Dictionary Structure



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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 Part XIII of its Administrative Practices.

SMPTE ST 335 was prepared by Technology Committee 30MR on Metadata and Registers.

Intellectual Property

At the time of publication, no notice had been received by SMPTE claiming patent rights essential to the implementation of this Standard. 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

This standard defines the structure of a dictionary of metadata elements that may be used in a range of applications such as production workflow applications, data exchange formats, and archival asset management systems.

The standard normatively defines universal identifiers, metadata element names, definitions, and standardized symbols, as well as other informative fields. These elements may be used as components in structured data models.

In addition to aiding the interoperability of data between applications, this standard also serves to distinguish similar elements through the unambiguous definitions of these elements and, when necessary, their application or conceptual context. The metadata elements defined by this standard include elements derived from both abstract semantics and application-specific elements.

Applications of individual metadata elements will vary but, when used, metadata shall conform to the definitions and formats in the metadata element dictionary.

Note: The previously published version of this document, SMPTE 335M-2001, had the title "Metadata Dictionary Structure". The title was changed to better describe the role of this document among the set of dictionary structure documents.

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. 298) and publication year (e.g. 2009) are functionally identical.

The following standards contain provisions which, 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 2003:2012, Types Dictionary Structure

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

ISO/IEC 8825-1:2008, Information Technology – ASN.1 Encoding Rules – Specification of Basic Encoding Rules (BER), Canonical Encoding Rules (CER), and Distinguished Encoding Rules (DER)

W3C Recommendation - Namespaces in XML 1.0 (Second Edition), World Wide Web Consortium, 16 August 2006. <http://www.w3.org/TR/REC-xml-names/>

4 Metadata Element Dictionary Structure

The metadata element dictionary provides flexibility in capturing metadata and exchanging it among applications through a standardized hierarchy of universal labels (ULs) that uniquely identify the metadata elements, grouped to aid their management within a small but comprehensive number of classes. Metadata classes are collections of metadata elements with common characteristics or attributes. Additional classes are provided for user-defined public, private, and experimental metadata.

The metadata element dictionary defined by this document provides two methods of referencing an individual item. The first is to use a unique, two-part, 16-byte universal label that is numerical (and hence language independent). The second method of referencing an item is to use its assigned symbol, which is a name that conforms to computer language syntax restrictions. Symbols are intended for use in computer languages such as the Extensible Markup Language (XML).

Note: The symbol, together with its namespace defined in Section 4.3.7, forms a unique identifier like the UL.

The exact format of the universal label shall be as defined in SMPTE ST 336. The first eight bytes of the universal label shall consist of the UL Header (2 bytes) and UL designator (6 bytes). The UL designator shall identify the item as belonging to a specific SMPTE register of a given category, structure, and version. The second eight bytes shall form the item designator as defined in SMPTE ST 336. The item designator shall be used to uniquely identify the meaning or definition of the item in the register.

A metadata element is an item of information of a single specified type with a defined representation. The type specified may itself be composed of a number of intimately related sub-items. For example a data type that specifies a date might include parts for day, month and year, or a type could be an array of items.

A value is an instance of information described by a metadata element. The dictionary also defines the required representation of values for each metadata element. The representation is composed of an assigned data type, a set of permissible values (if applicable), and the appropriate unit of measure (if applicable).

Individual data values can frequently be represented in more than one way — for example, it is possible to represent a textual value as an ISO 7-bit character or as Unicode, where the value is identical but the encoding is different. Certain encodings of a data value can be appropriate for use in some applications, but not others. If different representations of an element are required, then the last active byte of the item designator shall be used to define the representation in use — this byte is 00h for the representation first recorded in the metadata element dictionary. The mechanism by which the last active byte of the universal label is used to distinguish between different representations is described in more detail in SMPTE ST 336. Metadata elements identified in this way describe a single metadata element concept but differ in representation. For example, there are two metadata elements corresponding to “Organization Identifier Kind” in the current metadata element dictionary. One metadata element (06.0E.2B.34.01.01.01.04.01.01.10.02.00.00.00.00) is represented as a series of ISO 7-bit characters and has a defined maximum length of 32 bytes. The other metadata element (06.0E.2B.34.01.01.01.04.01.01.10.02.01.00.00.00) is represented as a UTF-16 (16-bit Unicode Transformation Format) string.

A single item in the metadata element dictionary shall not be used to describe metadata elements of different types.

The metadata element dictionary shall be organized into nodes and leaves. The dictionary classes form class nodes and below these are further nodes at each subclass. To aid the management of the dictionary, these nodes and subnodes shall be assigned a universal label, so as to give clear breaks in the structure. Entries within a subclass form leaves, which are the metadata element descriptions.

Nodes shall be used to define the overall structure of the metadata element dictionary; i.e., metadata classes and subclasses. The normative fields that define these classes/subclasses are specified in Section 4.3.

The nodes or leaves at each level shall be assigned either a level number in the range 1 to 127, encoded as a single byte within the UL, or a number greater than 128 encoded using multiple bytes as described by ISO 8825-1 BER Object Identifier Notation. This level number should be assigned sequentially, i.e. each new node or leaf under a node should be assigned a number one greater than the highest level number at the same level under the same node (or zero if it is the first). However, where a specific byte of all ULs under a node is set by another algorithm or taken from a set of permissible values specified in a defining document, a wildcard node may be used. In a wildcard node the first occurrence of “00h” in the UL identifying the node is treated as a wildcard by the leaves underneath. For example, byte 12 of the universal labels used to identify SMPTE unique material identifiers (UMIDs) indicates the “number creation method” as defined in SMPTE ST 330.

The universal labels used in the metadata dictionary defined by this document elements shall be constructed as shown in Table 1, which complies with SMPTE ST 336.

Table 1 – Construction of universal labels for the metadata element dictionary

Byte Position	Description	Value	Meaning
1	UL Header		
2	Object identifier	06h	Object identifier tag per SMPTE ST 298
3	UL length	0Eh	The byte length of the object identifier value is 14 bytes.
4	UL designator		
5	UL code	2Bh	The administering organization is an ISO organization.
6	UL subcode	34h	The delegated organization is SMPTE.
7	Registry category designator	01h	The registry category is dictionaries.
8	Registry designator	01h	The specific register is a metadata element dictionary.
9	Structure designator	01h	The dictionary structure conforms to this SMPTE standard.
10	Version number	01h to 7Fh	This indicates the version number of the register.
11-16	Item designator	Defined by the metadata element dictionary	This identifies a specific metadata element within the metadata element dictionary.

Note: As defined in SMPTE ST 298, a value of 00h at any position in a UL is treated as a terminator and all further values within that UL are required to be zero also.

4.1 Compatibility with Other Metadata Structures

The metadata element dictionary structure is a framework that supports global interoperability by defining metadata elements in a way that enables the interchange of metadata from different sources, applications, and third-party organizations.

Note: 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 element dictionary is not intended to replace conventions already in use, for example in textual naming or keywords. Within the framework of the metadata element dictionary structure, different content creation communities, media indexing professionals, or metadata extractors and users can develop metadata conventions that meet their specific requirements.

4.2 Individual Metadata Classes

Within the metadata element dictionary, metadata elements shall be organized into a hierarchical structure, where each is assigned to a metadata class as shown in the overview of Figure 1. The initial set of metadata classes in this standard consists of:

- Class 1: Identification and location
- Class 2: Administrative
- Class 3: Interpretive
- Class 4: Parametric