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First edition
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Television METADATA –

Part 1:
Metadata dictionary structure

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FOREWORD

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International Standard IEC 62261-1 has been prepared by Technical Area 6: Higher data rate storage media, data structures and equipment, of IEC technical committee 100: Audio, video and multimedia systems and equipment.

This standard cancels and replaces IEC/PAS 62261 published in 2001.

This first edition constitutes a technical revision.

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

CDV	Report on voting
100/853/CDV	100/954/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.

IEC 62261 consists of the following parts, under the general title *Television metadata*:

Part 1: Metadata dictionary structure

Part 2: Data encoding protocol using key-length-value

Part 3: Universal labels for unique identification of digital data

The committee has decided that the contents of this publication will remain unchanged until the maintenance result date indicated on the IEC web site under "http://webstore.iec.ch" in the data related to the specific publication. At this date, the publication will be

- reconfirmed;
- withdrawn;
- replaced by a revised edition, or
- amended.

A bilingual version of this publication may be issued at a later date.

TELEVISION METADATA –

Part 1: Metadata dictionary structure

1 Scope

The metadata dictionary structure defined in this part of IEC 62261 covers the use of metadata for all types of essence (video, audio, and data in their various forms). Applications of individual dictionary entries will vary but, when used, metadata shall conform to the definitions and formats in this metadata dictionary structure standard and the associated metadata dictionary recommended practice (IEC 62261-3). IEC 62261-3 defines a registered set of metadata element descriptions for association with essence or other metadata and this standard and the contents practice shall be used together as a pair – neither shall be used in isolation. The IEC may, from time to time, appoint other bodies to act as its Registration Authority and Agent for the compilation and safe keeping of IEC 62261-3 as described in IEC 62261-2.

2 Normative references

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

IEC 62261-2, *Television metadata – Part 2: Data encoding protocol using key-length-value*

IEC 62261-3, *Television metadata – Part 3: Universal labels for unique identification of digital data*

3 Metadata dictionary structure

3.1 General

The metadata dictionary structure provides flexibility in capturing metadata and exchanging it among applications through a standardized hierarchy of universal labels for 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 metadata.

IEC 62261-3 references an individual item or element of metadata using a two-part 16-byte universal label that is numerical (and hence language-independent) and unique. The first eight bytes label the second eight bytes as a “tag” in a specific version of a designated metadata dictionary (“tags” are defined in IEC 62261-2 (key-length-value encoding)). This tag is used to index the meaning or definition of the metadata element.

The actual metadata information described by the metadata element is the metadata value. The dictionary also contains information on the required format of metadata values and the allowable range of values (if applicable) either as a list or as a bounded range.

Individual data element values can frequently be represented in more than one way – for instance, it is possible to represent a textual value as ASCII or unicode, where the value is identical but the particular representation different. It is important both that the representation is known and that as new representations are registered they can be accommodated. In this case, the last active word of the tag defines the representation in use – the default being 00_h.

The metadata dictionary is organized into nodes and leaves. The dictionary classes just described form class nodes and below these are further nodes at each subclass. To aid the management of the dictionary, these nodes and subnodes are assigned tags to which no value is assigned, so as to give clear breaks in the structure. Entries within a subclass form leaves, which are the data elements themselves.

Lower levels of the dictionary structure can be derived from the tag structure in IEC 62261-3.

3.2 Compatibility with other metadata structures

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

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

3.3 Individual metadata classes

3.3.1 Organization

Within the metadata dictionary, metadata elements are 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: Administration
Class 3: Interpretive
Class 4: Parametric
Class 5: Process
Class 6: Relational
Class 7: Spatio-temporal
Class 15: Experimental

The number of metadata classes can be extended in the future to a maximum of 127. Although dictionary classes can be populated with any metadata (such as that associated with still images, audio, graphics, etc.), additional new classes may be created up to that limit to deal with specific metadata characteristics or attributes.

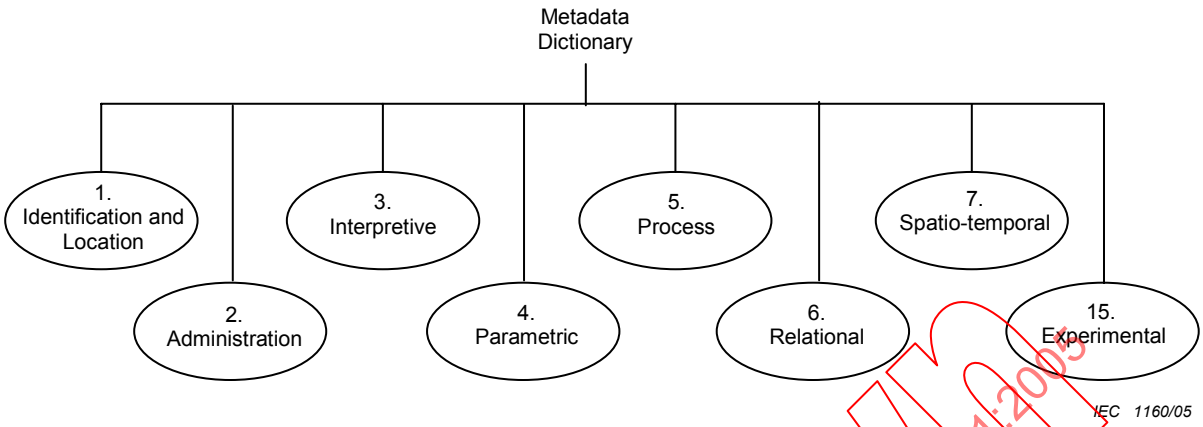

Figure 1 – Metadata class structure

3.3.2 Class 1: Identification and location

Metadata in this class shall consist of 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. 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 subclass titles in this class are

– globally unique identifiers;
– ISO identifiers;
– object identifiers;
– device identifiers;
– unique IPR identifiers;
– local locators;
– titles.

3.3.3 Class 2: Administration

Metadata in this class shall consist of administrative or business data that describe information about the essence or metadata that are relevant to its application. Information on authorized use and 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 subclass titles in this class are

– supplier;
– rights;
– financial information;
– security;
– publication outlet;
– participating parties;
– broadcast and repeat statistics.

3.3.4 Class 3: Interpretive

Metadata in this class shall consist of descriptive 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 (for example, keywords, narrative summary, titles, genre categories, scripts, etc.), or computational metrics (for example, colour histograms, texture maps, object shapes, facial features, etc.). Information in Class 3 shall be principally used for indexing, cataloguing, administering, searching, and retrieving the content of essence. Examples of subclass 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).

3.3.5 Class 4: Parametric

Metadata in this class shall consist of 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 subclass 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.

3.3.6 Class 5: Process

Metadata in this class shall consist of information that describes how the essence was processed or otherwise changed or enhanced after its origination. This class shall include, but not be limited to, many of the parameters in an edit decision list. Additional information in Class 5 shall be an audit trail (heritage) of all changes to the original content over time. Also included shall be a record of compression/decompression steps and any changes in storage media or format. Examples of subclass titles in this class are

– process indicators;
– manipulation;
– downstream processing history;
– enhancement or modification;
– audio processor settings (device-specific);
– editing information.

3.3.7 Class 6: Relational

Metadata in this class shall consist of information that describes relationships among objects in the content or among any combination of essence, objects, and metadata. Examples of subclass titles in this class are

– generic relationships;
– relatives;
– essence-to-essence relationship;
– metadata-to-essence relationship;
– metadata-to-metadata relationship;
– object-to-object relationship;
– metadata-to-object relationship;
– related production material;
– numerical sequence;
– relationship structures.

3.3.8 Class 7: Spatio-temporal

Metadata in this class shall consist of information about aspects of the content or the originating camera, sensor, or system relating to time, place, or space. Geospatial information in Class 7 shall be any information that defines the positions or places (either absolute or relative) of objects, scenes, individuals, or any other component of the essence. Temporal elements such as dates, time codes, synchronization marks, temporal keywords, and motion (vector) parameters shall also be part of Class 7 metadata. Examples of subclass titles in this class are

– position and space vectors;
– absolute position;
– image positional information;
– rate and direction of positional change;
– abstract locations;
– angular specifications;
– distance measurements;
– operational date and time information;
– absolute date and time;
– relative durations;
– rights date and time;
– setting date and time (characterized time period);
– delay;
– latency.

3.3.9 Class 15: Experimental

Metadata in this class shall consist of information whose definition and use does not need to conform to the definitions in the metadata dictionary. Class 15 metadata is intended for use in multimedia research or other limited access, experimental environments where experimentation with new metadata elements and applications does not depend on strict conformance to approved standards and which remain within a test or laboratory environment.

3.4 Dictionary element structure and format

The metadata dictionary shall consist of the following fields for each metadata element.

3.4.1 Data element tag

This has eight fields representing the eight octets or bytes of the data element tag. These uniquely identify the specific metadata element in the dictionary in a hierarchical fashion. Classes are designated with the first byte in the data element tag and subsequent bytes enable the hierarchical identification of subclasses and/or individual leaves.

3.4.2 Data element name

This entry is the English language name for the element represented numerically by the data element tag.

3.4.3 Dictionary version at introduction

This entry records the version number of the dictionary standard (i.e. the structure standard/recommended practice pair) which first recorded the allocation of a data element against a data element tag.

3.4.4 Data element definition

This entry is the detailed and unambiguous English language definition of what is represented by the data element tag and element name.

3.4.5 Type

This entry identifies the representation category of metadata value allowed for this element in order to permit correct interpretation of that value; for example, in the case of a text string or an SMPTE time code. A compound type entry is a class or subclass node or split in the metadata dictionary hierarchy and cannot have a value associated with it.

3.4.6 Value length

This entry defines the permitted length in bytes or characters of the value of the data element. In some cases, such as a text string, the length is not defined or limited and the value length is described as variable. However, in practice, a variable length may be limited by the application specification.

3.4.7 Value range

This entry defines any limitations on the permitted values of a data element.

3.4.8 Node/leaf

This entry defines whether the dictionary entry is a node in the classification structure or a leaf as defined in 3.1.

3.4.9 Defining document

In cases where the data element type or other parameter is defined in another document, this entry references that standard or the authoritative source of the information.