RP 225-2005

SMPTE RECOMMENDED PRACTICE

Registered Private Information in KLV

Table of contents

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.

This SMPTE practice was prepared by the Committee on Metadata and Wrapper Technology (W25).

Introduction

This introduction is informative and does not form a part of this practice.

This practice provides a mechanism to carry registered private information using KLV encoding. The primary initial purpose of this work is to provide a key definition and compatible KLV encoding and bridge to MPEG-2 transport metadata, including the ISO/IEC 13818-1:2000, AMD1, content_labelling_descriptor, and the ATSC A/53B, AMD2, Private Information Descriptor.

In its first-defined form here, the registered private information may be used by any organization by first obtaining a registered format_identifier from the SMPTE Registration Authority as authorized and defined further in ISO/IEC 13818-1. This format_identifier field provides an unambiguous scope for the payload — the "private information". Further, because it is defined as KLV, it allows the information to be carried using standard KLV encoding techniques.

The universal label-based key defined in this practice is not intended to be used alone as a label.

Approved March 9, 2005

1 Scope

This practice defines a mechanism for the carriage of registered private information encoded as KLV (key-length-value) in conformance with SMPTE 336M.

2 Normative references

The following standards contain provisions that, through reference in this text, constitute provisions of this practice. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this practice are encouraged to investigate the possibility of applying the most recent edition of the standards indicated below.

SMPTE 336M-2004, Television — Data Encoding Protocol Using Key-Length-Value

ISO/IEC 8825-1:1995 (ITU-T X.690), Information Technology — ASN.1 Encoding Rules — Specification of Basic Encoding Rules (BER), Canonical Encoding Rules (CER), and Distinguished Encoding Rules (DER), Pars. 8.1.3.4 and 8.1.3.5

ISO/IEC 13818-1:2000, Information Technology — Generic Coding of Moving Pictures and Associated Audio Information: Systems, Section 2.10, Annex O and Annex P

3 Universal label format for registered private information

SMPTE 336M defines the syntax of KLV coding. This practice defines how registered private KLV coded information may be carried when the registry category is set to the "registered private information" value of 0x05. This practice defines the Universal label (UL) as a key for the KLV coding for all registered private information. Table 1 summarizes the UL field values. The UL key shall be 16 bytes and not prematurely terminated with a zero byte.

Table 1 – Field descriptions for the UL key for the KLV encoding of private information

No.	Field	Description	Length	Content/Format
	Ul header			
1	OID	Object identifier	1 byte	Always 6
2	UL size	16-byte size of the UL	1 byte	Always $0E_h$
	UL designators			
3	UL code	Concatenated sub-identifiers ISO, ORG	1 byte	Always $2B_h$
4	SMPTE designator	SMPTE sub-identifier	1 byte	Always 34_h
5	Registry category designator	Registry category designator identifying this as a key for the KLV coding of registered private information as per SMPTE 336M	1 byte	Always 5
6	Registry designator	Registry designator identifying the specific registry	1 byte	As defined in table 2

The registry designator field shall be set to one of the defined registries listed in table 2. Values indicated as prohibited or SMPTE reserved shall not be used. The remaining UL fields are set depending on the value of the registry designator.

Table 2 – Registry designator values

Registry designator value	Description
0	Prohibited
1	Indicating that the registry is the ISO format_identifier
2 – $7F_h$	SMPTE reserved
80h – FF_h	Prohibited

The SMPTE reserved values (2 – $7F_h$) are intended to allow for the definition of other registries. These values may be assigned in a future version of this practice; for example the IEEE OUI or similarly managed number spaces.

The sections that follow define the remainder of the key UL value and any further constraints of the KLV length and value fields for each registry designator value.

4 ISO format_identifier registry

This section only applies when the registry designator field (byte 6) is set to 1 from table 2, indicating the ISO format_identifier registry. This key construction uses a registered ISO format_identifier value as defined in ISO 13818-1. (For registration of values, see http://www.smpte-ra.org/mpegreg.html). Use of unregistered format_identifier values is prohibited here in this use. A summary of bytes 6 through 16 of the key UL, when the ISO format_identifier registry is used, is summarized in table 3.

Table 3 – Field descriptions for the UL key for the KLV encoding of private information

No.	Field	Description	Length	Content/Format
6	Registry designator	Registry designator identifying the ISO/SMPTE format_identifier	1 byte	1
7	Structure designator	Designator of the structure variant within the given registry as further defined in this practice — indicating that the item designator is set to one of two mappings of the format_identifier	1 byte	1 or 2
8	Version number	Version of the given registry which first defines the item specified by the item designator — version 1 defined here	1 byte	1
9-16	Item designator	Unique identification of the particular item within the context of the UL designator set to a mapping of the registered format_identifier value	8 bytes	See below

The structure designator shall be set to either 1 or 2 to indicate which type of mapping of the format_identifier is used in the item designator field. Structure designator values of 0, and 80_h through FF_h inclusive are prohibited; and values of 3 through $7F_h$ inclusive are SMPTE reserved and shall not be used.

When the structure designator is set to 1, this first indicates that the value of the format_identifier is constrained to individual byte values between 0x01 and 0x7F inclusive (such as ASCII text, for example). Second, the item designator shall be constructed by mapping the format_identifier value into the first 4 bytes

directly, left-most byte first. For example, if there were a format_identifier value, "ABCD" (hex 41-42-43-44), the item designator bytes 9-12 would be set to: hex 41-42-43-44. The item designator bytes 13-16 are SMPTE reserved and shall be set to $7F_h$.

When the structure designator is set to 2, the format_identifier shall be encoded into the first 5 bytes (9-13) according to ISO 8825 BER OID. For example, if there were a format_identifier value, "ABCD" (hex 41-42-43-44), the item designator bytes 9-13 would be set to: hex 84-8A-89-86-44. Bytes 14-16 are SMPTE reserved and shall be set to $7F_h$. This encoding shall be used whenever any byte of the format_identifier value is outside the range of 01h through $7F_h$ inclusive.

For structure designator values 1 or 2, the version number field is set to 1 indicating the format defined in this practice.

4.1 KLV length

For structure designator values 1 or 2, the KLV length field shall be constructed according to SMPTE 336M, and may be BER short or long form encoded. Values of the length field should be less than 252 bytes in order to permit interoperability with some transports.

4.2 KLV value

For structure designator values 1 or 2, the KLV value field is defined privately by the registrant of the format_identifier value being used and is outside the scope of this practice. Any byte values may be used.

Annex A (informative)
Bibliography

ATSC A/53B, ATSC Digital Television Standard, Amendment #2:2003, Section 5.7.3.4, ATSC Private Information Descriptor

IEEE 802-1990, IEEE Standards for Local and Metropolitan Area Networks: Overview and Architecture (http://standards.ieee.org/regauth/oui/)

ISO/IEC 13818-1:2000, Information Technology — Generic Coding of Moving Pictures and Associated Audio Information: Systems, Amendment #1, Carriage of Metadata over ITU-T Rec H.222 | ISO/IEC 13818-1 Streams, Section 2.6.54