SMPTE STANDARD

D-Cinema Operations – Extended Facility List Message

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Approved
July 14, 2017

Foreword

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SMPTE Engineering Documents are drafted in accordance with the rules given in its Standards Operations Manual. This SMPTE Engineering Document was prepared by Technology Committee 21DC.

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.

Introduction

This section is entirely informative and does not form an integral part of this document.

To issue D-Cinema Packages and corresponding Key Delivery Messages, it is necessary to collect information on the devices present at the target exhibition facility, e.g. digital certificates, 3D capabilities, etc. SMPTE ST 430-7:2008, which specifies a Facility List Message (FLM) structure for this purpose, has been superseded in practice by ad-hoc solutions. This document updates SMPTE ST 430-7:2008 to specify an Extended FLM structure, which builds on the latter.

As depicted in Figure 1, each Extended FLM instance contains information on a single facility, which houses multiple auditoriums and devices. Devices can be associated with either the facility as a whole or with each auditorium individually, where they are grouped into playback suites. Multiple components – software, hardware and firmware – can be associated with each device.

Figure 1: Extended Facility List Message Structure

Specific capabilities, e.g. 3D playback, can be associated with facilities, auditoriums and devices. This allows, for instance, a capability enabled by the combination of multiple devices to be associated with an auditorium. This specification defines a number of capabilities, and allows other specifications to easily define additional capabilities as needed.

1 Scope

This document specifies the Extended Facility List Message structure, which allows information on the equipment deployed at a D-Cinema facility to be exchanged between parties for the purpose of issuing D-Cinema Packages, as specified in SMPTE ST 429-2, and corresponding Key Delivery Messages, as specified in ST 430-1.

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; then formal languages; then figures; and then any other language forms.

3 Normative References

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

Internet Assigned Numbers Authority (1987). Eggert, P. and A. Olson, "Sources for Time Zone and Daylight Saving Time Data" (ftp://ftp.iana.org/tz/code/tz-link.htm)

SMPTE ST 430-1:2009, D-Cinema Operations — Key Delivery Message

SMPTE ST 430-2:2006, D-Cinema Operations — Digital Certificate.

SMPTE ST 428-12:2013, D-Cinema Distribution Master – Common Audio Channels and Soundfield Groups

ITU-T Recommendation E.123 (02/2001), Notation for national and international telephone numbers, e-mail addresses and Web addresses

ISO 3166-1, Codes for the representation of names of countries and their subdivisions – Part 1: Country codes

World Wide Web Consortium (W3C) (2004, October 28). XML Schema Part 1: Structures (Second Edition).

World Wide Web Consortium (W3C) (2004, February 4). Extensible Markup Language (XML) 1.0 (Third Edition).

Internet Engineering Task Force (IETF) (2008, October). RFC 5322 Internet Message Format.

World Wide Web Consortium (W3C) (2002, February 12). XML Signature Syntax and Processing.

4 Overall

4.1 Schema

This specification uses inline XML Schema definitions, as specified in W3C XML Schema Part 1: Structures, to specify XML structures. All definitions shall belong to the XML Schema. These schema definitions shall belong to the XML Schema whose root element is listed in Table 1.

Table 1: XML Schema Root Element Definition

```
<xs:schema elementFormDefault="qualified" xmlns:xs="http://www.w3.org/2001/XMLSchema"
  xmlns:flm="http://www.smpte-ra.org/ns/430-16/2017/FLM"
  targetNamespace="http://www.smpte-ra.org/ns/430-16/2017/FLM"
  xmlns:dcml="http://www.smpte-ra.org/schemas/433/2008/dcmlTypes/"
  xmlns:ds="http://www.w3.org/2000/09/xmldsig#">
<!-- schema definitions found in this document -->
</xs:schema>
```

In the event of a conflict between schema definitions and the prose, the prose shall take precedence.

Imported namespaces shall correspond to the specifications defined in Table 2.

Table 2: Imported Namespaces

Namespace	Specification
`http://www.smpte-ra.org/schemas/433/2008/dcmlTypes/`	`SMTPE ST 433`
`http://www.w3.org/2000/09/xmldsig#`	`W3C XML Signature Syntax and Processing`

NOTE: The `http://www.w3.org/2000/09/xmldsig#` namespace is imported since its `KeyInfo` element is used in the Facility List Message structure to carry the digital certificate chains associated with a device (see Section 5.9.13). The `Signature` element defined in the same namespace is not used however.

4.2 Instance

A Facility List Message instance is `FacilityListMessage` element, as specified in Table 3.

Table 3: FacilityListMessage element definition

```
  <xs:element name="FacilityListMessage" type="flm:FacilityListMessageType"/>
```

4.3 FLM Document

An FLM Document is an XML document whose root is a Facility List Message instance.

An FLM Document shall use UTF-8 encoding, as specified in W3C Extensible Markup Language (XML).