

SMPTE STANDARD

XML Representation of SMPTE Registered Data (Reg-XML) — AAF and MXF Data



Page 1 of 22 pages

Table of Contents	Page
Foreword	2
Intellectual Property	2
Introduction.....	2
1 Scope	4
2 Conformance Notation	4
3 Normative References	5
4 Definition of Acronyms, Terms and Notation	5
4.1 Acronyms and Terms	5
5 AAF Baseline Meta Dictionary (Informative)	5
5.1 Meta Dictionary Representation.....	5
5.2 Meta Dictionary and SMPTE Registers	5
6 Mapping Rules for AAF Data	7
6.1 AAF Reg-XML File Group	7
6.2 AAF Reg-XML Document.....	7
6.3 Extension Meta Dictionaries	7
Annex A Bibliography (Informative)	8
Annex B AAF Baseline Meta Dictionary (Normative).....	9
Annex C AAF and MXF XML Schema (Informative).....	10
Annex D Guidelines: MXF Files and AAF Reg-XML File Groups (Informative).....	11
D.1 Mapping Between KLV Local Sets and Reg-XML Document Fragments	11
D.2 Decode MXF Files, Encode as AAF Reg-XML File Groups	12
D.3 Decode an AAF Reg-XML File Group, Encode as an MXF File	17
Annex E Guidelines: AAF Files and AAF Reg-XML File Groups (Informative)	20
E.1 Mapping Between Structured Storage Files and AAF Reg-XML File Groups	20
E.2 Decode AAF Structured Storage Files, Encode as AAF Reg-XML File Groups.....	21

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 2001-2 was prepared by Technology Committee 31FS.

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 Engineering Document.

An AAF Reg-XML file group consists of a SMPTE ST 2001-1 AAF Reg-XML document and associated stream files that conform to the AAF baseline data model provided by this document. An AAF Reg-XML file group is capable of carrying header metadata and essence streams that can also be carried in MXF and AAF files.

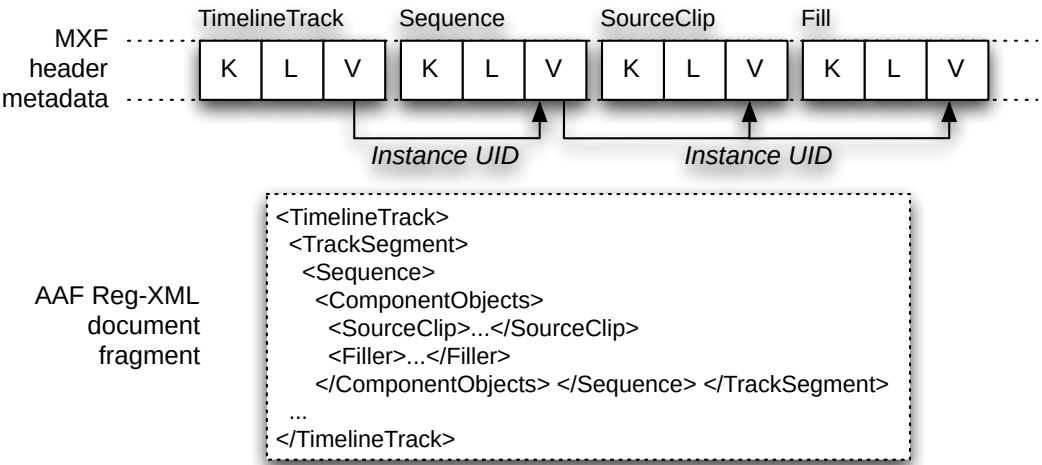


Figure 1 – Example equivalence of KLV and XML representations

AAF data has a hierarchical structure and is commonly encoded in either MXF or AAF files. As illustrated in Figure 1, MXF files are encoded as a sequence of KLV packets, where the hierarchical data is flattened out

into the file by the use of a referencing scheme. An AAF Reg-XML file group is an alternative encoding, with metadata items encoded as elements in an XML document, and where a nesting of XML elements is used to represent the hierarchy of the AAF data. Irrespective of its encoding format, the AAF instance data is the same.

This document provides both the baseline dictionary required to map AAF instance data to an AAF Reg-XML file group and the rules to do so. For developers, informative annexes provide an XML schema for the validation of AAF Reg-XML documents and guidelines for starting with one format of AAF data and encoding it as another. For example, guidelines for how to start out with an MXF file and end up with an AAF Reg-XML file group.

1 Scope

This document specifies:

- a Reg-XML baseline data model for AAF data (Annex B);
- rules for mapping AAF data to AAF Reg-XML file groups (Section 6).

An XSD Schema that can be used to validate AAF data encoded as an AAF Reg-XML document is provided in Annex C. This schema is the result of applying of the model mapping rules of SMPTE ST 2001-1.

Further annexes to this document provide informative guidelines for a developer, describing the process of:

1. starting with a MXF file and encoding it as an AAF Reg-XML file group (Annex D, Section D.2);
2. identifying suitable AAF Reg-XML file groups and encoding them as an MXF file (Annex D, Section D.3);
3. starting with an AAF file and encoding it as an AAF Reg-XML file group (Annex E).

Due to the zero-divergence approach applied at the time, the MXF data model is within the AAF baseline data model. Also, the harmonization of the registered names for data model items enables consistent representation of the two data models as a single Reg-XML data model.

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 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

The following standards contain provisions that, through reference in this text, constitute provisions of this standard. 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 2001-1:2013, XML Representation of SMPTE Registered Data (Reg-XML) — Mapping Rules

4 Definition of Acronyms, Terms and Notation

4.1 Acronyms and Terms

AAF: Advanced Authoring Format

Namespace: XML Namespace

Reg-XML file group: A collection containing a Reg-XML document and the stream files that provide the value of stream-type properties.

URN: Uniform Resource Name

UUID: Universally Unique IDentifier

XML: eXtensible Markup Language

XSD: XML Schema Definition – an XML document containing a schema expressed in XSDL

5 AAF Baseline Meta Dictionary (Informative)

5.1 Meta Dictionary Representation

The normative representation for the *AAF baseline meta dictionary* is provided in Annex B. This document element is generated from an authoritative source for the AAF data model provided by the Advanced Media Workflow Association. The same source is used for equivalent definitions contained in the SMPTE registers. In general, the two representations align.

According to the precedence rule of Annex B, in the event of a conflict between the definitions of the AAF baseline meta dictionary and another definition, such as one in the SMPTE registers, the model defined in this document has to take precedence.

5.2 Meta Dictionary and SMPTE Registers

This document contains a complete statement of the AAF and MXF baseline meta dictionary in Annex B. Any AAF Reg-XML file group encoding of AAF instance data, including instance data decoded from an MXF file, is with reference to the baseline provided in this document. For information only, this section describes the implicit relationship between the SMPTE registers and the baseline meta dictionary

The relationship between the definitions of the AAF baseline meta dictionary and the SMPTE registers is illustrated in Figure 2.

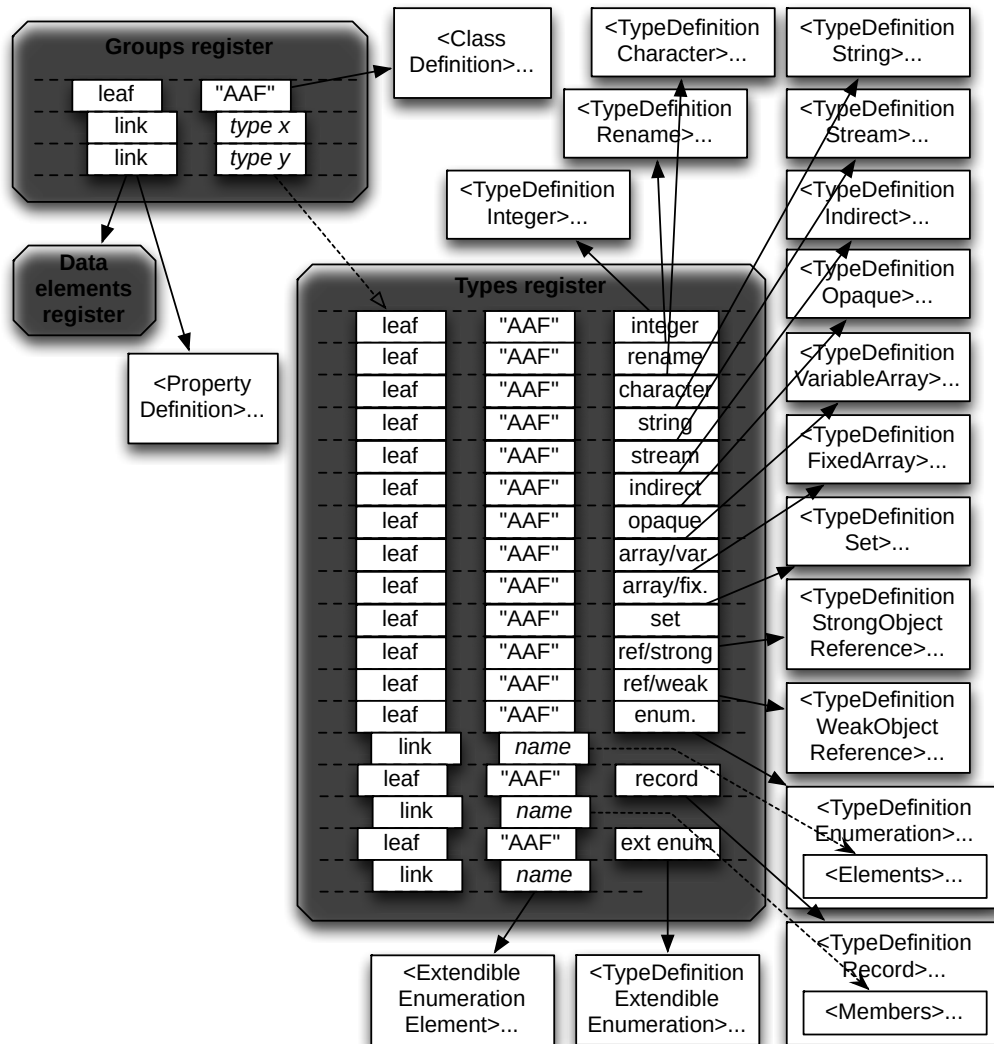


Figure 2 – AAF baseline data model and SMPTE registers

As a general rule, meta definitions are included in the baseline as follows:

1. All class definitions in the baseline data model are registered as groups in the SMPTE Groups Register, with "AAF" listed as an application. Only classes that extend "InterchangeObject" are included in the baseline dictionary. The meta dictionary and meta definition classes are not included in the baseline model as these are normatively specified by the Reg-XML data model of ST 2001-1 and are represented accordingly in Reg-XML.
2. All property definitions in the baseline data model are registered as members of groups in the SMPTE Groups Register, with "AAF" listed as an application. According to the defined structure of the registers, these *link* entries refer to leaf entries in the SMPTE Elements Register. The criterion for including a property definition in the AAF baseline is that it is a member of one of the included class definitions.
3. All type definitions in the baseline data model are registered as types in the SMPTE Types Register, with "AAF" listed as an application. The type definitions that are included in the AAF baseline are those that are required to represent values of included property definitions.

6 Mapping Rules for AAF Data

This section specifies the normative rules for mapping AAF instance data to a Reg-XML encoding of that data.

6.1 AAF Reg-XML File Group

An *AAF Reg-XML file group* shall consist of a single Reg-XML document, known as the *AAF Reg-XML document*, and external stream data files.

The single AAF Reg-XML document shall be used to represent metadata items of AAF data.

A separate and non-XML stream file shall be used to represent the value of each property of stream type in the AAF data.

6.2 AAF Reg-XML Document

The baseline meta dictionary of the AAF Reg-XML document shall be the baseline meta dictionary of Annex B of this document. The data mapping rules of SMPTE ST 2001-1 shall be applied to encode the AAF data.

Note 1: According to the rules of SMPTE ST 2001-1, the root element of the AAF Reg-XML document will be “AAF”, defined in the default namespace:

<http://www.smp-te-ra.org/schemas/2001-2/2013/aaf>

The root object of the data section of the AAF Reg-XML document shall be the single *Preface* object contained in the AAF data.

Note 2: Valid AAF data contains only one preface object. Applying the Reg-XML part 1 rules to this element will result in a complete serialization of all of the metadata items of the AAF instance data.

6.3 Extension Meta Dictionaries

The baseline meta dictionary shall not be included in the AAF Reg-XML document.

Any data instance not fully defined by definitions in the baseline shall be defined by additional meta definitions contained in an extension scheme. Full definition shall include class definitions, property definitions and type definitions sufficient to represent a value of the data instance. In a way that ensures all data instances are fully defined for an AAF Reg-XML document, all extension schemes containing meta definitions shall be included in the AAF Reg-XML document according to the rules of SMPTE ST 2001-1.

The encoding of any meta dictionary and meta definition in an AAF Reg-XML document shall use the XML schema provided in Annex A of SMPTE ST 2001-1.

References made from extension meta definitions to other extension meta definitions shall either be resolvable within the same scheme, with reference to a definition in the AAF baseline or with reference to another extension scheme included in the AAF Reg-XML document.

An extension scheme should be included in its entirety.

For example, a SMPTE ST 377-1 MXF Application Metadata Plugin Scheme is defined in a standalone SMPTE document. This can be represented as an extension meta dictionary that is included into any AAF Reg-XML document that uses it.

Note: Artifacts of other encoding mechanisms that are not explicitly defined in the AAF baseline model of Annex B, such as SMPTE ST 377-1 MXF partitions or AAF structured storage, are not encoded in the AAF Reg-XML document.