

# **Administrative Guideline**



## **Use of XML in Engineering Documents**

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This Standards Administrative Guideline forms an adjunct to the use and interpretation of the SMPTE Standards Operations Manual. In the event of a conflict, the Operations Manual shall prevail.

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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.

## 1 Scope

This Administrative Guideline specifies selected uses of the Extensible Markup Language (XML) in SMPTE Engineering 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; 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 Administrative Guideline. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this document are encouraged to investigate the possibility of applying the most recent edition of the standards indicated below.

W3C Recommendation, "XML Schema Part 1: Structures Second Edition", 28 October 2004, <http://www.w3.org/TR/2004/REC-xmlschema-1-20041028/>

W3C Recommendation, "XML Schema Part 2: Datatypes Second Edition", 28 October 2004, <http://www.w3.org/TR/2004/REC-xmlschema-2-20041028/>

W3C Recommendation, "Extensible Markup Language (XML) 1.0 (Fifth Edition)", 26 November 2008, <http://www.w3.org/TR/2008/REC-xml-20081126/>

W3C Recommendation, "Namespaces in XML 1.0 (Third Edition)", 8 December 2009, <http://www.w3.org/TR/2009/REC-xml-names-20091208/>

W3C Recommendation, "HTML 5.2", 14 December 2017, <https://www.w3.org/TR/html5/>

IETF RFC 3986, "Uniform Resource Identifiers (URI): Generic Syntax", T. Berners-Lee, et al., January 2005. <http://www.ietf.org/rfc/rfc3986.txt>

### 4 General

#### 4.1 License

Any document that (a) is defined by an Engineering Document and (b) conforms to Extensible Markup Language (XML) 1.0, whether within the prose or as an Additional Element, shall be licensed according to Annex A.

#### 4.2 Header

Additional Elements of Engineering Documents that conform to Extensible Markup Language (XML) 1.0 should include the text of Annex B, at the head of document and with the text between triple brackets replaced as specified.

### 5 XML Namespaces

#### 5.1 Overview (informative)

XML namespaces, specified in W3C Namespaces in XML 1.0, are used to avoid collisions between independent XML vocabularies (attributes and elements), and provide an unambiguous and human-readable

link to the specifications that define these vocabularies. Each XML namespace has its unique name, which is a URI that conforms to RFC 3986.

## 5.2 XML Elements and Attributes

Each XML element and attribute defined by an Engineering Document should be qualified by an XML namespace name, as defined in W3C Namespaces in XML 1.0.

NOTE: It is customary for related elements and attributes to share a common XML namespace.

## 5.3 Defining XML Namespaces

In most circumstances, an Engineering Document that defines XML elements and attributes will also define one or more XML namespaces, since it is rarely possible to add items to an XML namespace defined elsewhere.

An Engineering document may define any number of XML namespaces, and all such XML namespaces shall be SMPTE XML namespaces as specified in Section 5.45.3, unless otherwise permitted by Section 5.7.

## 5.4 SMPTE XML Namespaces

### 5.4.1 Name Syntax

The name of a SMPTE XML Namespace shall conform to the `NS` syntax below specified using RFC 7405:

```
NS = %s"http://www.smpte-ra.org/ns/" PUBNUM "/" REVISION [ "/" SHORTNAME ]
SHORTNAME = 1*4("/" 1*(ALPHA / DIGIT / "-" / "_" / ".") )
PUBNUM = 1*(DIGIT) ["-" 1*(DIGIT)]
REVISION = STABLEREV / EXPREV
STABLEREV = 4(DIGIT) [2(DIGIT)]
EXPREV = %s"experimental-" 1*(ALPHA / DIGIT / "-" / "_" / ".")
```

`PUBNUM` shall represent the official publication number of the Engineering Document, without leading zeroes and including a part number, if any, separated by a hyphen, e.g. 456-1.

`SHORTNAME` is used when the Engineering Document defines more than one XML namespace. It may provide a human meaningful designation of the namespace, but shall not to include any version information.

The fragment identifier component shall not be present.

NOTE 1: While fragment identifier components are not used in namespace URIs, they can be used to generate identifiers unique to the specification, e.g. as values in enumerations.

A stable SMPTE XML namespace is a SMPTE XML namespace whose name is such that `REVISION`:

- conforms to `STABLEREV`, which consists of a year encoded as 4 decimal digits and, optionally, a month encoded as 2 decimal digits in the range 1-12; and
- represent the date that the XML namespace URI first appeared in the Engineering Document.

NOTE 2: The `REVISION` component of a stable SMPTE XML namespace does not necessarily correspond to the publication date of its defining Engineering Document. For instance, the defining Engineering Document can be revised in such a way that the contents of the XML Namespace remain unchanged. The XML Namespace Definition Document, specified in Section 5.6, contains an unambiguous link to the published Engineering Document.

An experimental SMPTE XML namespace is a SMPTE XML namespace whose name is such that `REVISION` conforms to `EXPREV`.

Such experimental SMPTE XML namespace are available for use in draft Engineering Documents to readily identify XML namespaces that are hence susceptible to change prior to publication.

Until an Engineering Document is presented to Draft Publication ballot, any SMPTE XML namespace defined therein may be an experimental SMPTE XML namespace, unless the SMPTE XML namespace was previously defined in a published Engineering Document; thereafter, any SMPTE XML namespace defined in the Engineering document shall be a stable SMPTE XML namespace.

NOTE 3: No changes to XML namespace names are necessary following a Draft Publication ballot since XML namespace names are constructed independently of the publication date of the Engineering Document.

#### 5.4.2 Examples (informative)

The following is an example name from a SMPTE XML namespace:

```
http://www.smpte-ra.org/ns/456/2005/foo
```

One can immediately see that the namespace "foo" is defined in a SMPTE Engineering Document numbered "456" and initially appeared in the year "2005". One would assume that a "foo" was a well-known artifact to SMPTE members, at least for those that have read Engineering Document number "456".

The following is an example XML namespace name defined in a document with a part designation and that originally appeared in September of 2005:

```
http://www.smpte-ra.org/ns/456-1/200509/foo
```

The following is a name from an XML namespace defined in a draft version of the same specification:

```
http://www.smpte-ra.org/ns/456-1/experimental-20141001/foo
```

The following is not equivalent to the previous name since it is missing the string [www](http://www). (the two URIs can nevertheless resolve to the same resource when used in an HTTP GET query):

```
http://smpte-ra.org/ns/456-1/experimental-20141001/foo
```

The following is not a valid SMPTE XML Namespace since a fragment is used:

```
http://www.smpte-ra.org/ns/456-1/experimental-20141001/foo#hello
```

#### 5.4.3 Registration (informative)

The SMPTE XML namespace syntax ensures uniqueness across Engineering Documents, and thus no specific registration steps are required.

## 5.5 Change Policy

An Engineering Document that defines an XML namespace should specify whether the XML namespace is mutable, i.e. whether changes to the set of names defined by that XML namespace are allowed without also changing the name of the XML namespace.

## 5.6 XML Namespace Definition Document

For each XML namespace defined in an Engineering Document, an XML Namespace Definition Document shall be publicly retrievable at the XML Namespace URI.

Each XML Namespace Definition Document shall be human-readable and include:

- a reference to the most recent revision of the defining Engineering Document
- download links, if available, to any Additional Elements making use of the XML Namespace, e.g. XML Schema, WSDL, etc..

The XML Namespace Definition Document should conform to HTML, as specified in HTML 5.2.

Annex C lists a sample XML Namespace Definition Document.

## 5.7 Compatibility with Legacy XML Namespace URI Syntax

Earlier versions of this Administrative Guideline specified a substantially different syntax for XML Namespace URIs. For instance, the string "schemas" was used instead of "ns" and a number sign ("#") character could terminate the URI, with an otherwise empty fragment identifier component. This syntax is deprecated.

Published Engineering Documents that conform to prior versions of this specification, as well as their revisions and amendments, may continue to do so.

# 6 XML Schema

## 6.1 Introduction (informative)

Using a formal language like XML Schema, specified in XML Schema Part 1: Structures Second Edition, to describe conformance requirements can avoid some of the ambiguity inherent with using English prose alone, while allowing the use of existing commercial tools to facilitate testing and validation.

NOTE: The following provisions are derived in part from Good Practice 11 at W3C QA Framework: Specification Guidelines, Formal Languages, Good Practice E. and Guidelines for the use of formal languages in IETF specifications.

## 6.2 Using XML Schema

XML Schema, as specified in XML Schema Part 1: Structures Second Edition, may be used normatively or informatively in an Engineering Document, either by inclusion or by reference.

### 6.3 Precedence

Engineering Documents may specify a policy in case of a conflict between prose and XML Schema. In absence of such policy, the precedence rules specified in the Conformance section of AG-04 applies.

### 6.4 Avoiding Discrepancies

To help avoid discrepancies between the English prose and the XML Schema, prose sections should be bound to the related portion of the XML Schema, so that one cannot be modified without the other.

NOTE 1: One method to bind prose to XML Schema is to include XML Schema definitions inline within the prose. Another method is for the prose to refer to XML Schema definitions specified in appendices or Additional Elements.

Any Additional Element that conforms to XML Schema, and duplicates normative XML Schema definitions specified in the Prose Element, shall be normative.

NOTE 2: Informative XML Schema definitions can be used as examples, e.g. to demonstrate how to define an extension to another XML Schemas through the <xs:any> mechanism .

### 6.5 Language Version

Whenever an XML Schema is provided and any portion of it is normative, the Engineering Document shall provide a normative reference to the XML Schema specification it conforms to.

It is also recommended that a reference (although it may be bibliographic) be made to the XML language specification itself.

### 6.6 External Definitions

The defining document of any externally-defined XML namespaces shall be included as a normative reference if the XML schema is normative.

### 6.7 Well-Formed Definitions

All XML Schema defined in a SMPTE Engineering Document shall be well-formed and valid with respect to the XML Schema language.

### 6.8 Example Instances

All example instance documents shall be informative.

All example instance documents shall be well-formed. If an example instance document is document, then it shall be valid with respect to the XML Schema defined.

Graphical representations of the schema structure should be included when it adds clarity.

## **6.9 Publication**

All Additional Elements of Engineering Documents conforming to XML Schema shall be publically retrievable at an HTTP URI chosen by the Director of Engineering.

NOTE: The same URI is also listed in the Namespace Definition Document per Section 5.5 if the XML Schema Document specifies a target namespace.

## Annex A XML Document License

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## Annex B XML Element Header

```
<!--  
[[TEXT OF XML DOCUMENT LICENSE OF SECTION ANNEX A IN AG-05]]  
-->  
  
<!--  
This document can be retrieved at  
  
    [[[INSERT URI WHERE THE DOCUMENT IS PUBLISHED]]]  
  
and is an element of  
  
    [[[INSERT SMPTE DOCUMENT REFERENCE]]] ,  
  
which is available at http://standards.smpte.org.  
  
To ensure interoperability, users are encouraged to:  
  
(a) retain this notice;  
  
(b) retrieve the recent versions of this document and its companion  
defining engineering document. In particular, this document alone might  
not be sufficient to ensure interoperability;  
  
(c) highlight and explain any modification they make to this document; and  
  
(d) report issues to [[[INSERT SMPTE CONTACT]]].  
-->
```

## Annex C Sample XML Namespace Definition Document (informative)

```
<!DOCTYPE html>
<html>
  <head>
    <meta charset="utf-8" />
    <title>XML Namespace Definition Document for ST 2071-2</title>
  </head>
  <body>
    <div>
      <p>This namespace is specified in
      SMPTE ST 2071-2:2016</p>
      <p>
      st2071-2q-2016.xsd is an XML Schema document associated with the namespace.</p>
      <p>
      < st2071-2r-2016.wsdl is a WSDL document associated with the namespace.</p>
    </div>
  </body>
</html>
```

## **Bibliography (informative)**

QA Framework: Specification Guidelines, W3C Recommendation, 17 August 2005.  
<http://www.w3.org/TR/2005/REC-qaframe-spec-20050817/>

IETF Guidelines for the use of formal languages in IETF specifications.  
<http://www.ietf.org/IESG/STATEMENTS/pseudo-code-in-specs.txt>

SMPTE AG02:2015 Engineering Documents

SMPTE AG04-1:2015 SMPTE ST-RP-Template

SMPTE AG04-2:2015 SMPTE EG-Template