ATSC Standard: A/360:2019 Amendment No. 1, "A/360 Schema"

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Revision History

Version	Date
Amendment approved	22 May 2020

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1. OVERVIEW

1.1 Definition

An Amendment is generated to document an enhancement, an addition or a deletion of functionality to previously agreed technical provisions in an existing ATSC document. Amendments shall be published as attachments to the original ATSC document. Distribution by ATSC of existing documents shall include any approved Amendments.

1.2 Scope

This document describes a set of changes to fix an omission in previous publication of ATSC A/360, namely to properly reference and document XML Schemas which are normative and authoritative.

1.3 Rationale for Changes

The changes described in this document are being proposed because the treatment of schemas is insufficient.

1.4 Compatibility Considerations

The changes described in this document are backward-compatible relative to the currently published version of the standard to which this Amendment pertains and any previously approved Amendments for that standard. The change described are formally necessary, but any implementations of the previous versions of the standard would have necessarily inferred the schema specifications below.

2. CHANGE INSTRUCTIONS

Change instructions are given below in *italics*. Unless otherwise noted, inserted text, tables, and drawings are shown in blue; deletions of existing text are shown in ~~red strikeout~~. The text "[ref]" indicates that a cross reference to a cited referenced document should be inserted.

2.1 Add Normative Reference

In Section 2.1, add a new normative reference (and renumber informative references and citations):

[27] W3C: "XML Schema Part 2: Datatypes Second Edition" W3C Recommendation, Worldwide Web Consortium, 28 October 2004. https://www.w3.org/TR/xmlschema-2/

2.2 Add "Extensibility" Section

In Section 3, add a new subsection 3.5:

3.5 Extensibility

The protocols specified in the present Standard are designed with features and mechanisms to support extensibility. In general, the mechanisms include:

- Use of "protocol version" fields

- Definition of fields and values reserved for future use
- Use of XML, which is inherently extensible by means of future addition of new attributes and elements, potentially associated with different namespaces

Receiving devices are expected to disregard reserved values, and unrecognized or unsupported descriptors, XML attributes and elements.

2.3 Add "XML Schema and Namespace" Section

In Section 3, add a new subsection 3.6:

3.6 XML Schema and Namespace

A number of new XML elements are defined and used in this Standard. These elements provide various Service signaling elements and attributes defined in this Standard (see for example Section 5.2.2.2 Certificate and OCSP Response LLS Table). These new XML elements are defined with separate namespaces in schema documents that accompany this Standard. The namespaces used by various schemas are described in individual sections of the present document. The sub-string part of namespaces between the right-most two '/' delimiters indicate major and minor version of the schemas. The schemas defined in this present document shall have version '1.0', which indicates major version is 1 and minor version is 0.

The namespace designator, "`xs:`", and many terms in the "Data Type" column of tables is a shorthand for datatypes defined in W3C XML Schema [27] and shall be as defined there.

In order to provide flexibility for future changes in the schema, decoders of XML documents with the namespaces defined in the present document should ignore any elements or attributes they do not recognize, instead of treating them as errors.

All element groups and attribute groups are explicitly extensible with elements and attributes, respectively. Elements can only be extended from namespaces other than the target namespace. Attributes can be extended from both the target namespace and other namespaces. If the XML schema does not permit this for some element, that is an error in the schema.

XML schemas shall use `processContents="strict"` in order to reduce inadvertent typos in instance documents. Further, users are encouraged to modify all referenced third-party schemas to change `processContents` to `"strict"`.

XML instance documents shall use UTF-8 encoding.

In the event of any discrepancy between the XML schema definitions implied by the tables that appear in this document and those that appear in the XML schema definition files, those in the XML schema definition files are authoritative and take precedence.

The XML schema document for the schemas defined in this document can be found at the ATSC website.

2.4 Modify Text in Section 5.2.2.2

In Section 5.2.2.2, modify the 2nd and 3rd paragraphs as shown (including splitting the 2nd paragraph after "0x06"):

When one or more signaling tables are signed, the CertificationData LLS Table shall be included among the LLS Tables described in ATSC A/331 [26] Section 6.1, and shall use LLS_table_id 0x06.

The CDT~~, and~~ shall be represented as an XML document containing a CertificationData root element that conforms to the definitions in the XML schema that has namespace:

tag:atsc.org,2016:XMLSchemas/ATSC3/Delivery/CDT/1.0/

The definition of this schema is in an XML schema file, *CDT-1.0-20200229.xsd*, accompanying this Standard, as described in Section 3.6 above.

Note that the CertificationData LLS Table is a standalone table that contains its own signature (i.e., is not in a signed_multitable message), as the data in the CertificationData LLS Table is required to verify the signature of a signed_multitable message.

The XML schema xmlns short name should be "cdt". The CertificationData LLS Table has the following informative description:

Table 2.1 CertificationData XML Format

Element or Attribute Name	Use	Data Type	Short Description
CertificationData			Root element of the CertificationData table.
ToBeSignedData	1		
@OCSPRefresh	1	xs:dayTimeDuration	The duration for which an OCSPResponse is considered valid from its producedAt time.
Certificates	1..N	Base64 String	A list of certificates that are used to authenticate a broadcaster signature. This must include end-entity certificates authenticating the CurrentCert and the CMSSignedData signing certificate and any intermediate CA certificates used to validate these certificates. The Root CA certificate is not included in the list.
CurrentCert	1	Base64 String	SubjectKeyIdentifier for the certificate currently used to sign signaling messages.
CertReplacement	0..1		
@NextCertFrom	1	xs:d~~D~~ateTime	Earliest time at which NextCert can be validly used.
@CurrentCertUntil	1	xs:d~~D~~ateTime	Latest time at which CurrentCert can be validly used.
NextCert	1	Base64 String	SubjectKeyIdentifier for the certificate next used to sign signaling messages.
CMSSignedData	1	Base64 String	A CMS Signed Data structure authenticating the ToBeSignedData contained in this table.
OCSPResponse	1..N	Base64 String	A set of OCSP Responses that provide status information for each of the Certificates.

2.5 Modify Text in Section 5.2.2.7

In Section 5.2.2.7, modify as shown:

Where CMS Signed Data is transmitted as an XML structure, the characteristics shall be as specified in Section 5.2.2.1 and shall be represented as an XML document containing a CMSSignedData root element that conforms to the definitions in the XML schema that has namespace:

tag:atsc.org,2016:XMLSchemas/ATSC3/Delivery/CMSSD/1.0/

The definition of this schema is in an XML schema file, *CMSSD-1.0-20200229.xsd*, accompanying this Standard, as described in Section 3.6 above.

The XML schema xmlns short name should be "cmssd". The informative definition of this XML schema is as follows:

Table 5.2 CMS Signed Data XML Format

Element or Attribute Name	Use	Data Type	Short Description
CMSSignedData	1	Base64 string	A base64 encoded encapsulation of the CMS Signed Data structure (RFC 5652 [13])

Any data compression shall be applied after the CMS Signed Data XML document has been appended to the message.

– End of Document –