ATSC Standard: A/331:2024-04 Amendment No. 1, “Data Service Type, et al”

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Revision History

Version	Date
Amendment approved	13 February 2025

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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 adds a new Service Type (aka @serviceCategory) value, "Data"; deprecates Service Type "EA" (Emergency Alert); clarification of an IANA footnote from S33-708r1; adds support for VVC per S33-733r1; adds acronyms and service definitions, BIP and BEST; and adds CodecString from S33-724r3.

The construction of the Data Service may or may not be publicly documented, may involve codecs other than HEVC and AC-4 or no codecs at all, and is uniquely identified globally. Services using alternative codecs, e.g. AVC or AAC with or without a BA, if otherwise properly encoded, appear in the service list (if the receiver can decode the codecs) offering it as a normal service to the viewer. This amendment is in response to New Project Proposals:

- N-077, "A/331 Private Data Services and Minor Enhancements and Corrections"
- N-061, "TAI-UTC" (partially)

1.3 Rationale for Changes

The changes described in this document are being proposed because privately-defined data services are in use today and there is no standard way to signal or identify them. The current situation complicates good receiver behavior. It also deprecates the Emergency Alert Service, since it has not been used and there are no plans to use it. Finally, a footnote on p26 about IANA was incorrect and confusing.

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 addition of a new service type should not affect deployed receivers, which are expected to ignore it (per the standard). There are no known implementations of the Emergency Alert Service Type. The IANA footnote is a clarification and correction to a URL to align the description of the IANA registration elements with the actual IANA registry and to simplify the text to reduce the possibility of inadvertent inaccuracies.

2. LIST OF CHANGES

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 Change Instructions

In Section 2.1, "Normative References," change/add the following reference documents and renumber as needed.

[36] ISO/IEC: "Information technology – Coding of audio-visual objects – Part 15: Carriage of network abstraction layer (NAL) unit structured video in ISO base media file format," Doc. ISO/IEC 14496-15:2022~~14 with Cor. 1:2015~~, International Organization for Standardization/

[37] EIDR: "Introduction to EIDR Video Services Registry," The Entertainment ID Registry Association, v0.3, 2016/11/18 http://eidr.org/documents/Introduction_to_the_EIDR_Video_Services_Registry.pdf.

[38] IETF: RFC 4151, "The "tag:" URI Scheme" Internet Engineering Task Force, Reston, VA, October 2005 http://tools.ietf.org/html/rfc4151.

[39] ISO/IEC: 23090-3:2023 | Rec. ITU-T H.266 (9/2023), "Information technology — Coded representation of immersive media — Part 3: Versatile Video Coding," Geneva, Switzerland.

[40] ISO/IEC: 23094-2:2021, "Information technology — General video coding — Part 2: Low complexity enhancement video coding" Geneva, Switzerland.

In Section 3.3, "Acronyms and Abbreviations," add as follows:

BEST – Broadcast-Enabled Streaming Television

BIP – Broadcast IP

In Section 3.4, "Terms," change/add as follows:

~~EA Service – Service that delivers rich media resources that are referenced in an emergency alert CAP message.~~

BEST Service, BIP Service – A Broadband Service Configuration as defined in 8.2.1.2.2, where low-level signaling is delivered via broadcast and all Components are delivered over broadband.

In Section 5.3, "Service Types and Service Configurations," update as follows:

The types of ATSC 3.0 Services that are currently defined are:

1) Linear Audio/Video Service
2) Linear Audio-Only Service
3) App-Based Service
4) ESG Service
5) ~~EA Service~~(Deprecated)
6) DRM Data Service
7) Data Service[1]

1 Note that TTA uses code point 10 for data-only services; and globalServiceId is optional (not required).

These Service Types correspond to the values of `SLT.Service@serviceCategory`. New Service Types may be defined in future versions of this Standard. Properties of the above Service Types are shown in Table [XX] to provide guidance in selecting the proper Service Type.

Table XX Service Type Properties

Service Type	Video (HEVC)	Audio (AC-4)	Captions (IMSC1)	Held/Apps (A/344)	Undefined Data
Reserved (0)	X	X	X	X	X
Linear A/V (1)	M	M	O	O	X
Linear audio only (2)	X	M	O	O	X
App-Based (3)	O	O	O	M	X
ESG (4)	X	X	X	X	X
Deprecated (5)	X	X	X	X	X
DRM (6)	X	X	X	X	O
Data (7)	O	O	O	O	O

M – mandatory, O – optional, X – forbidden

In Section 5.4, "Rules Regarding ROUTE or MMTP Usage," update as follows:

The rules regarding presence of ROUTE sessions and/or MMTP sessions for carrying the Components of an ATSC 3.0 Service shall be as follows:

a) For a broadcast delivery of a Linear Service without app-based feature, the Service's Components are carried by either (but not both):
   - One or more ROUTE sessions, or
   - One or more MMTP sessions.

b) For broadcast delivery of a Linear Service with app-based feature, the Service's Components are carried by:
   - One or more ROUTE sessions, and
   - Zero or more MMTP sessions.

   Use of both MMTP and ROUTE for streaming Components in the same Service shall be disallowed.

c) For broadcast delivery of an app-based Service, an ESG Service, ~~an EA Service,~~ or a DRM Data Service the Service's Components are carried by:
   - One or more ROUTE sessions.

d) For broadcast delivery of a Data Service the Service's Components are carried by:
   - One or more ROUTE sessions, or
   - One or more MMTP sessions.

In Section 6.1 "IP Address Assignment" on p.26, update the footnote as follows:

[2] IANA has assigned this multicast address to ~~atsc-mh-ssc~~AtscSvcSig and this port address as atsc-mh-ssc~~AtscSvcSig although these packets are not intended for distribution over a LAN or WAN subsequent to reception~~. For details, see https://www.iana.org/assignments/multicast-addresses/multicast-addresses.xml and https://www.iana.org/assignments/service-names-port-numbers/service-names-port-numbers.xhtml.

In Section 6.3.1, "SLT Syntax Description," update as follows:

- In Table 6.2, change the instance of "Other Rf" to "OtherRf". (*Remove the space.*)
- In Table 6.2, change the instance of "(-180.0 ≤ long ≤ 180.0)" to "(-180.0 ≤ long < 180.0)". (*Change the second instance of the "less than or equal" sign to a "less than" sign.*)

In Section 6.3.1, "SLT Syntax Description," update as follows:

(Table 6.2)

…			
@globalServiceID	0..1	anyURI	A globally unique URI that identifies the ATSC 3.0 Service. This attribute is not present for the ESG~~, EAS,~~ and DRM Data Services.
….			
@configuration	0..1	token	Declares the Service Configuration.
CodecStrings	0..N		Container for MPD @codec strings
@codecs	1		A delimited list of MPD @codec strings per RFC6381 [30]
…			

…

`@codecs` – This list of one or more `@codec` strings shall identify the set of `@codec` strings which are present in an MPD for this Service. This list shall conform to RFC6381 [30]. Note that RFC6381 [30] requires that each `@codec` string begins with a registered "4CC" code (see RFC6381 [30], Sec. 3.3). A receiver might use this field to determine if it is capable of correctly decoding and presenting the content that is part of this Service.

In Section 6.3.2, "SLT Semantics," update as follows:

`@globalServiceID` – The globally unique URI value that shall represent the identity of this ATSC 3.0 Service. This attribute provides the linkage to, and its value shall be identical to that of the **`Service`**`@globalServiceID` attribute in the A/332 ESG [5] for this Service. This attribute shall be present for the Linear A/V, Linear audio only, and app-based Services. ~~Absence of this attribute implies that this ATSC 3.0 Service is the ESG, EAS, or DRM Data Service.~~ When `@serviceCategory` is set to "Data", `@globalServiceId` shall be present and shall conform to a URL based on either EIDR Video Service IDs [XX] or "tag:" as per RFC 4151 [XX]. The form of EIDR is: https://doi.org/10.5239/[eidrVideoServiceID] where eidrVideoServiceID is the EIDR Video Service ID that corresponds to a Service registered with EIDR. The EIDR Video Service ID is an identifier in a database curated by EIDR. Video Service IDs begin with "10.5239".

The form of tag: shall be as tag:[DNSname],[year]:[uniqueString] where: DNSname is a registered domain name controlled by the broadcaster. This DNS should remain in the control of the broadcaster even if there is no site content. year is any year in which the broadcaster controlled the DNSname. uniqueString is a string of symbols that is unique to the broadcaster and used 1:1 to identify a Service. In order to use this core "tag:" syntax for other purposes by the broadcaster, it is recommended that the string begin with "`globalServiceID`", but any discriminator including none will satisfy the requirements in this section.

`@majorChannelNo` – An integer number in the range 1 to 999 that shall represent the "major" channel number of the Service. Assignment of major channel numbers shall follow the guidelines given in A/65 Annex B [1] in order to guarantee that the two-part channel number

combinations used by a licensee of an ATSC 3.0 broadcast will be different from those used by any other such licensee with an overlapping DTV Service Area. Note that an ATSC 3.0 broadcast Service may use the same two-part channel number combination in use in an ATSC A/53 broadcast within the DTV Service Area, given equivalent programming between the two. Specification of a `@majorChannelNo` is not required for Services that are not intended to be selected directly by viewers, such as an ESG data delivery Service ~~or an EAS rich media delivery Service~~.

`@minorChannelNo` – An integer number in the range 1 to 999 that shall represent the "minor" channel number of the Service. This number is not required for Services that are not intended to be selected directly by viewers, such as an ESG data delivery Service ~~or an EAS rich media delivery Service~~.

`@shortServiceName` – Short name of the Service (up to 7 characters). This name is not required for Services that are not intended to be selected directly by viewers, such as an ESG data delivery Service ~~or an EAS rich media delivery Service~~.

Table 6.1 Code Values for **`SLT.Service`**`@serviceCategory`

`serviceCategory`	Service Type
0	ATSC Reserved
1	Linear A/V Service
2	Linear audio only Service
3	App-Based Service
4	ESG Service (program guide)
5	(Deprecated)~~EA Service (emergency alert)~~
6	DRM Data Service
7	Data Service
Other values	ATSC Reserved

In Section 7, "Service Layer Signaling," update as follows:

For Service delivery using ROUTE, the SLS for each Service describes characteristics of the Service, such as a list of its Components and where to acquire them, the receiver capabilities required to make a meaningful presentation of the Service, and the availability and associated rules regarding access to file repair services by receivers.

In ROUTE the SLS shall include the tables based on Service Type and Configuration as shown in Table 7.1 through Table 7.2.

Table 7.2 SLS Table Requirements per Service Type for Broadcast Configuration

Table Service Type	S-TSID	USBD[2]	MPD	HELD App/no App	DWD App/no App	RSAT	APD
Linear A/V	M	O	M	M/na	O/na	O	O
Linear Audio	M	O	M	M/na	O/na	O	O
App Based	M	O	O	M/na	O/O	O	O
ESG	M	O	na	na/na	na/na	O	O
~~EA~~	~~M~~	~~O~~	~~na~~	~~na/na~~	~~na/na~~	~~O~~	~~O~~
DRM Data	M	O	na	na/na	na/na	O	O
Data	M	O	O	O/O	O/O	O	O

M = Mandatory, O = Optional, na = Not Applicable (and no defined semantics)

Table 7.3 SLS Table Requirements per Service Type for Broadband Configuration

Table Service Type	S-TSID[2]	USBD[2]	MPD	HELD App/no App	DWD App/no App	RSAT	APD
Linear A/V	O	O	M	M/na	O/na	O	O
Linear A	O	O	M	M/na	O/na	O	O
App Based	O	O	O	M/na	O/O	O	O
ESG	O	O	na	na/na	na/na	O	O
~~EA~~	~~O~~	~~O~~	~~na~~	~~na/na~~	~~na/na~~	~~O~~	~~O~~
DRM Data	O	O	na	na/na	na/na	O	O
Data	O	O	O	M/na	O/O	O	O

M = Mandatory, O = Optional, na = Not Applicable (and no defined semantics)

In Section 7.1.3, "User Service Description," Table 7.3 update as follows:

`DeliveryMethod` 0..N Container of transport-related information pertaining to the contents of the Service over broadcast and (optionally) broadband modes of access. This element is not applicable to and therefore shall be absent for ESG~~, EAS~~ and DRM Data Services.

…

Name – This element shall contain the name of this ATSC 3.0 Service as given by one or more languages as defined by its lang attribute. Absence of this attribute shall imply that the Service name is unnecessary to be indicated in the USBD. For example, this Service is the ESG~~, EAS~~ or DRM Data Service.

DeliveryMethod – A complex element whose subordinate elements and attributes contain transport related information pertaining to the contents of this ATSC 3.0 Service. This element shall contain information on the delivery mode (broadcast, broadband, or via both paths) for each of those Components. This element is not applicable to and therefore shall be absent for the ESG~~,~~ ~~EAS~~ and DRM Data Services.

7.2.3.2 Video Stream Properties Descriptor

7.2.3.2.1 Syntax

…

codec_code – This field shall specify a 4-character code for a codec. The value of these four characters shall be one of 'hev1', 'hev2', 'hvc1', ~~or~~ 'hvc2', 'lhv1', 'lhe1', 'vvc1', 'vvc2', 'vvi1' or

[2] A/331:2020 required this SLS table.

'vvi2', with semantic meaning for these codes as specified in ISO/IEC 14496-15 [36] as amended.

…

profile_tier_level(profileFPResentFlag, maxSubLayersMinus1) – This variable-sized field shall provide the profile, tier, level syntax structure as described in H.265 (10/2014) HEVC specification Section 7.3.3 [39].

Scalability Information

Table 7.4 Bit Stream Syntax for Scalability Information,

Syntax	No. of Bits	Format
scalability_info() {		
asset_layer_id	6	uimsbf
scalable_type_id~~reserved~~	2	uimsbf~~'11'~~
}		

asset_layer_id – This 6-bit unsigned integer field shall specify the nuh_layer_id [39] for this asset. The value of asset_layer_id shall be in the range of 0 to 62, inclusive. The value 63 is reserved.

scalable_type_id – This 2-bit unsigned integer field shall specify the scalable profile or codec utilized for this asset. The value of scalable_type_id shall be in the range of 0 to 2, inclusive. The value 3 is reserved.

Table 7.15 Values of scalable_type_id

scalable_type_id	Meaning
'00'	HEVC Scalable Main 10 Profile (SHVC)[39]
'01'	MultiLayer VVC Main Profile [39]
'10'	MPEG-5 LCEVC Main Profile [40]
'11'	reserved

– End of Document –