

# **SMPTE Public Committee Draft**

## **Extensible Time Label — Profiles**



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Page 1 of 20 pages

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<b>Table of Contents</b>	<b>Page</b>
Foreword .....	3
Introduction .....	4
1 Scope .....	4
2 Normative References .....	5
3 Terms and Definitions .....	5
4 TLX Profiles .....	5
5 Registered TLX Profile List .....	7
5.1. Unique Identification Profiles .....	7
5.1.1. Digital Birth Certificate (DBC) Profile .....	7
5.1.2. PTP Timestamp Sequence (ptpSEQ) Profile .....	8
5.1.3. Count Sequence (countSEQ) Profile .....	9
5.2. ST 12 based workflows .....	9
5.2.1. ST 12-1 Timecode (ST12-1) Profile .....	9
5.2.2. ST 12-3 Timecode (ST12-3) Profile .....	10
5.2.3. US-ASCII (US-ASCII) Profile .....	11
5.3. Time and Time-Like .....	12
5.3.1. Time Only (TimeOnly) Profile .....	12
5.3.2. Local Time (TimeLoc) Profile .....	13
5.3.3. Time-Like (TimeLike) Profile .....	13
5.4. Versioning .....	15
5.4.1. TLX v1 (TLXv1) Profile .....	15
6 TLX Profile Schemas .....	16
Annex A (Informative) Use of TLX Profile JSON Schemas .....	17
A.1 General .....	17
A.2 Single Profile Use .....	17
A.3 Profile Composition .....	18
A.4 Invalid Profile Composition .....	18
<a href="#">Bibliography (Informative)</a> .....	20

## 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.

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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.

## Introduction

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

TLX is a protocol for data collection and distribution specified by the SMPTE 2120 family of Engineering Documents. The design reflects the intended primary purpose of labeling media units with time and related data, but TLX can be used to represent any recurring data set.

A TLX label comprises one or more TLX “Items”. Each TLX item is an unordered collection of name-value pairs, representing “Attributes”, which represent the associated metadata for a particular parameter. TLX items are specified in SMPTE ST 2120-2.

TLX is designed to be Extensible. Any new TLX item can be defined by a Revision of, or Amendment to, ST 2120-2. Further, TLX implementations are encouraged to preserve TLX items and attributes that are not recognized, to better support downstream processes might make use of such items and attributes.

This document provides named collections of optional constraints, called “Profiles”, which can be used to ensure that a TLX is suited to a particular purpose, thereby enhancing interoperability among applications using TLX. The document also provides guidance for the creation of additional Profiles.

Profiles can be a convenient way to establish intra- or inter-organization standards for content delivery. A TLX does not assert compliance with a profile. However, compliance with a profile, or more than one profile simultaneously, is possible by inspection.

[Editors notes: The following paragraph will be replaced with the appropriate patent information during the SMPTE Headquarters publication process.]

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.

## 1 Scope

This document lists the currently Registered TLX Profiles. For each Registered TLX Profile, this document specifies a unique profile name and corresponding constraints for TLX labels, including item and attribute presence and values.

This document also specifies the techniques used for describing the Profiles herein. These techniques can be used for the creation of additional Profiles.

## 2 Normative References

The following References contain provisions that, through reference in this text, constitute provisions of this recommended practice. Dated references require that the specific edition cited shall be used as the reference. Undated citations refer to the edition of the referenced document (including any amendments) current at the date of publication of this document. All Recommended Practices are subject to revision, and users of this engineering document are encouraged to investigate the possibility of applying the most recent edition of any undated reference.

SMPTE ST 2120-1:202x Extensible Time Label – Structure

SMPTE ST 2120-2:202x Extensible Time Label – Items

## 3 Terms and Definitions

### 3.1. TLX Profile

set of required and prohibited items and other constraints such that a TLX is suited to a stated purpose

### 3.2. Registered TLX Profile

TLX profile specified in this document

### 3.3. virtual (TLX label, item, or attribute)

recoverably omitted for being redundant

### 3.4. sparse (TLX label, item, or attribute)

remaining, while a similar element is virtual

### 3.5. inferred (TLX label, item, or attribute)

previously virtual but now reconstructed based on sparse TLX elements and/or other information

## 4 TLX Profiles

While a TLX label must include at least one item to be valid, there is no specific TLX item that is always required. However, for a TLX label to be usable for a particular purpose, certain TLX items could be necessary and further, to avoid confounding that purpose, other TLX items might be precluded.

A TLX profile shall specify which TLX items are required, and any that are prohibited, for a TLX label to conform to the profile. Additional constraints on the label may also be included in the profile specification (e.g., the presence or absence of optional attributes, and constraints on values of attributes). There are no specific requirements or limitations on the rules for a profile, except that the rules shall be self-consistent and unambiguous.

The constraints imposed by a TLX profile should assume they are being evaluated against a valid TLX label. In some cases, for purposes of clarity, a TLX profile may repeat constraints already imposed by ST 2120-2.

Whether a TLX complies with a particular profile can be determined by inspection, e.g., by analyzing the TLX label with a profile-specific schema or, in some cases, inspecting more than one TLX label.

TLX profiles, particularly registered TLX profiles, will be convenient for establishing intra- or inter-organization standards for content delivery. Profiles could be useful where data sets are established for use outside of the original purpose of media unit labeling.

Profiles may be informal and unregistered. For use within a specific organization, a profile may be just an internal agreement that a particular set of TLX items will be used. Profiles may also be formalized by incorporation in this document by Revision of, or Amendment to, this document, thereby becoming registered TLX profiles.

Registered TLX profiles are allocated a unique 8-character TLX Profile Name. Only printable US-ASCII characters (i.e., the 7-bit codes corresponding to the Unicode code points from 0x0020 to 0x007E) are used in the profile name of a registered profile. Note that these are specified in ISO/IEC 646-US.

Registered profile names shall not start with the asterisk character (\*); non-registered Profiles should start with the asterisk character (\*). It is recommended that subsequent characters in an unregistered profile not be the name of a registered profile."

In some cases, a TLX label can conform to multiple profiles simultaneously.

In some cases, a set of TLX profiles might comprise contradictory constraints, such that no TLX can conform to them simultaneously.

A profile does not preclude any items other than those listed as prohibited. A profile may designate "<other items>" as prohibited, in which case, items not otherwise listed as part of the profile shall not be present in a conforming TLX label.

A profile does not preclude attributes other than those listed in the profile as prohibited, or that are otherwise precluded by the TLX item as specified in ST 2120-2. A profile may designate "<other attributes>" as prohibited, in which case, attributes not otherwise listed in the profile, or otherwise listed as required for the specified item in ST 2120-2, shall not be present in a conforming TLX label.

## 5 Registered TLX Profile List

### 5.1. Unique Identification Profiles

#### 5.1.1. Digital Birth Certificate (DBC) Profile

##### 5.1.1.1. Purpose

This profile shall be designated by the profile name "DBC".

A TLX complying with the Digital Birth Certificate (DBC) profile provides a sufficiently unique identifier for the corresponding media unit, suitable for use as the basis for a key in a database such that relationships to the media unit can be established. Relationships can also be established to consecutive ranges of media units using the TLXmediaCount as an index.

For environments where media units are live-captured or streamed and labeled in a real-time sequence from one source, the PTP Timestamp Sequence profile can be compatibly overlapped with this DBC profile by further constraining the TLXuniqueSourceID and TLXptpTimestamp items, and adding the TLXmediaCount item.

##### 5.1.1.2. Constraints

A TLX compliant with the DBC profile shall conform to the constraints listed in Table 1.

**Table 1 — DBC Profile Item Constraints**

TLX Item/Attribute	Value	Required/Prohibited
TLXuniqueSourceID	any	Required
TLXmediaCount	any	Required
TLXptpTimestamp	any	Required

The TLXuniqueSourceID can remain constant for labels generated by a label source. A TLXuniqueSourceID may be used repeatedly for more than one sequence labeled by that source. When labeling subsequent sequences, the TLXptpTimestamp shall ascend in time for each subsequent sequence and not descend in time for any subsequent TLX.

In the case where TLXmediaCount is part of the organizing principle for accessing a sequence, an offset from the TLXmediaCount value can provide an index to address another media unit within that sequence.

While a TLXuniqueSourceID is always provided by the generator which also sets a TLXptpTimestamp according to the current time, a TLXmediaCount can be prescribed, allowing

the TLXmediaCount to be managed as part of an organizing principle for a sequence. For example, in the case of a camera, an initial TLXmediaCount can be set to match a time of day as a count of frames since a beginning of day. In a different example, a render farm generating image frames might be directed to set the TLXmediaCount as part of the job for each frame being rendered, which can advantageously be used to convey sequence information that, for example, might correspond to a frame count number in the filename when delivered to an appropriate folder.

### 5.1.2. PTP Timestamp Sequence (ptpSEQ) Profile

#### 5.1.2.1. Purpose

This profile shall be designated by the profile name "ptpSEQ".

A TLX complying with the PTP Timestamp Sequence profile provides a sufficiently unique identifier for the corresponding media unit, suitable for use as the basis for a key in a database such that relationships to the media unit can be established. This profile is intended for real-time environments, e.g., with media units live-captured or streamed and labeled in a real-time sequence from one source. Therefore, relationships can also be established to temporal ranges of media units.

This profile can be compatibly overlapped with the Digital Birth Certificate profile by applying the additional constraints for this profile and adding a TLXmediaCount.

#### 5.1.2.2. Constraints

A TLX compliant with the PTP Timestamp Sequence profile shall conform to the constraints listed in Table 2.

**Table 2 — PTP Timestamp Sequence Profile Item Constraints**

TLX Item	Value	Required/Prohibited
TLXptpTimestamp	any	Required
TLXuniqueSourceID	any	Required

To comply with this profile: TLX labels shall be generated for media units of a sequence, from one source, in real time, such that a consecutive TLXptpTimestamp increments according to the media unit interval of the previously labeled media unit and any intervening media units; TLXuniqueSourceID shall be the same for all media units of the sequence; and, TLXptpTimestamp shall not be virtual.

Where these TLX items are used as the organizing principle, TLXuniqueSourceID shall not be virtual. Where these TLX items are not the organizing principle, TLXuniqueSourceID may be virtual.



### 5.1.3. Count Sequence (countSEQ) Profile

#### 5.1.3.1. Purpose

This profile shall be designated by the profile name "countSEQ".

A TLX complying with the Count Sequence profile provides a sufficiently unique identifier for the corresponding media unit, suitable for use as the basis for a key in a database such that relationships to the media unit can be established. Relationships can also be established to consecutive ranges of media units having the same TLXuniqueSourceID and using the TLXmediaCount as an index.

#### 5.1.3.2. Constraints

A TLX compliant with the Count Sequence profile shall conform to the constraints listed in Table 3.

**Table 3 —Count Sequence Profile Item Constraints**

TLX Item	Value	Required/Prohibited
TLXmediaCount	any	Required
TLXuniqueSourceID	any	Required

To comply with this profile when labeling a sequence, TLXuniqueSourceID shall be the same for all media units of the sequence and shall not be repeated for any other sequence, and TLXmediaCount shall increment by one for each consecutive media unit of the sequence.

To comply with this profile within a sequence, the TLXuniqueSourceID and TLXmediaCount items and/or any of their attributes, may be virtual.

Where these TLX items are used as the organizing principle, TLXmediaCount and TLXuniqueSourceID shall not be virtual.

In the case where TLXmediaCount is part of the organizing principle for accessing a sequence, an offset from the TLXmediaCount value can provide an index to address another media unit within that sequence.

## 5.2. ST 12 based workflows

### 5.2.1. ST 12-1 Timecode (ST12-1) Profile

#### 5.2.1.1. Purpose

This profile shall be designated by the profile name "ST12-1".

A TLX complying with the ST 12-1 Timecode profile carries information sufficient to populate a Time and Control Code, as specified by SMPTE ST 12-1.

### 5.2.1.2. Constraints

A TLX compliant with the ST12-1 profile shall conform to the constraints listed in Table 4

**Table 4 — ST12-1 Profile Item Constraints**

TLX Item	Value	Required/Prohibited
TLXst12	as constrained by Table 5	Required

**Table 5 — ST12-1 Profile Attribute constraints**

TLX Item	Attribute	Value	Required/Prohibited
TLXst12	timeAddress	any	Required
TLXst12	subFrame	any	Prohibited
TLXst12	modulus	“24”, “25”, “30”, “48”, “50” or “60”	Optional

Within a sequence, the TLXst12 item and/or any of its attributes may be virtual in labels compliant with the ST12-1 profile when the TLXst12 item was generated to represent the sequence. Where the TLXst12 item is not representative of the sequence (i.e., the value of a TLXst12 attribute changes in a way that cannot be predicted from its position within the sequence), then labels, items, and such attributes shall not be virtual.

## 5.2.2. ST 12-3 Timecode (ST12-3) Profile

### 5.2.2.1. Purpose

This profile shall be designated by the profile name "ST12-3".

A TLX complying with the ST 12-3 Timecode profile carries information sufficient to populate a Time and Control Code, as specified by SMPTE ST 12-3.

### 5.2.2.2. Constraints

A TLX compliant with the ST12-3 profile shall conform to the constraints listed in Table 6

**Table 6 — ST12-3 Profile Item Constraints**

TLX Item	Value	Required/Prohibited
TLXst12	as constrained by Table 7	Required

**Table 7 — ST12-3 Profile Attribute constraints**

TLX Item	Attribute	Value	Required/Prohibited
TLXst12	timeAddress	any	Required
TLXst12	subFrame	“00”, “04”, “08”, “0c”, “10”, or “18”	Required
TLXst12	bgFlags	any	Prohibited
TLXst12	colorFrame	any	Prohibited
TLXst12	fieldMark	any	Prohibited
TLXst12	modulus	“72”, “96”, “100”, “120 (30x4)”, or “120 (24x5)”	Optional

Within a sequence, the TLXst12 item and/or any of its attributes may be virtual in labels compliant with the ST12-3 profile when the TLXst12 item was generated to represent the sequence. Where the TLXst12 item is not representative of the sequence (i.e., the value of a TLXst12 attribute changes in a way that cannot be predicted from its position within the sequence), then labels, items, and such attributes shall not be virtual.

### 5.2.3. US-ASCII (US-ASCII) Profile

#### 5.2.3.1. Purpose

This profile shall be designated by the profile name "US-ASCII".

A TLX complying with the US-ASCII profile provides a TLXsourceName for which the name attribute has a length in Unicode characters that is the same as its length in bytes. This property could be important for certain applications.

The US-ASCII character set is defined in ISO/IEC 646-US and is consistent with the Unicode characters as specified in ISO/IEC 10646:2020.

#### 5.2.3.2. Constraints

A TLX compliant with the US-ASCII profile shall conform to the constraints listed in Table 8.

**Table 8 —US-ASCII Profile Item Constraints**

TLX Item	Value	Required/Prohibited
TLXsourceName	as constrained by Table 9	Required

To comply with this profile when labeling a sequence, the TLXsourceName shall be the same for all media units of the sequence. Within a sequence, the TLXsourceName item may be virtual in labels compliant with this profile.

**Table 9 — US-ASCII Profile Attribute constraints**

TLX Item	Attribute	Value	Required/Prohibited
TLXsourceName	name	individual Unicode values shall be in the range [0x20-0x7e]	Required

Note: The US-ASCII character set is defined in ISO/IEC 646-US, one of a set of standards ISO/IEC 646, each documenting different national variants. These variants use the same code points, but some can correspond to different glyphs.

### 5.3. Time and Time-Like

#### 5.3.1. Time Only (TimeOnly) Profile

##### 5.3.1.1. Purpose

This profile shall be designated by the profile name "TimeOnly".

A TLX complying with the Time Only profile is a record of the creation time of the label for a corresponding media unit. This profile is intended for real-time environments, e.g., with media units live-captured or streamed and labeled in a real-time sequence from one source.

##### 5.3.1.2. Constraints

A TLX compliant with the Time Only profile shall conform to the constraints listed in Table 10

**Table 10 — Time Only Profile Item Constraints**

TLX Item	Value	Required/Prohibited
TLXptpTimestamp	as constrained by Table 11	Required
<other items>	any	Prohibited

**Table 11 — Time Only Profile Attribute constraints**

TLX Item	Attribute	Value	Required/Prohibited
TLXptpTimestamp	ptpTime	any	Required
TLXptpTimestamp	localOffset	any	Optional
TLXptpTimestamp	isLeapSecond	any	Optional
TLXptpTimestamp	<other attributes>	any	Prohibited

To comply with this profile: TLX labels shall be generated for media units of a sequence, from one source, in real time, such that a consecutive TLXptpTimestamp increments according to the media unit interval of the previously labeled media unit and any intervening media units; and, TLXptpTimestamp shall not be virtual.

### 5.3.2. Local Time (TimeLoc) Profile

#### 5.3.2.1. Purpose

This profile shall be designated by the profile name "TimeLoc".

A TLX complying with the Local Time profile is a record of the creation time of the label for a corresponding media unit that can be interpreted as local time.

#### 5.3.2.2. Constraints

A TLX compliant with the Local Time profile shall conform to the constraints listed in Table 12

**Table 12 — Local Time Profile Item Constraints**

TLX Item	Value	Required/Prohibited
TLXptpTimestamp	as constrained by Table 13	Required

**Table 13 — Local Time Profile Attribute constraints**

TLX Item	Attribute	Value	Required/Prohibited
TLXptpTimestamp	ptpTime	any	Required
TLXptpTimestamp	localOffset	any	Required

To comply with this profile when labeling a media unit, the localOffset attribute value shall represent the offset in integer seconds from the ptpTime attribute value relative to the local time at which the label was generated, such that  $\text{ptpTime} + \text{localOffset}$  results in the local time, as specified in ST 2120-2.

### 5.3.3. Time-Like (TimeLike) Profile

#### 5.3.3.1. Purpose

This profile shall be designated by the profile name "TimeLike".

A TLX complying with the Time-Like profile provides the TLXmediaCount item and sufficient metadata for interpreting that count as a time-like value of whole seconds and portions of seconds.

Note: Portions of seconds can be presented as whole media units, as provided by the equations in ST 2120-2, or as decimal fractions of seconds.

### 5.3.3.2. Constraints

A TLX compliant with the Time-Like profile shall conform to the constraints listed in Table 14

**Table 14 —Time-Like Profile Item Constraints**

TLX Item	Value	Required/Prohibited
TLXmediaCount	as constrained by Table 15	Required

**Table 15 — Time-Like Profile Attribute constraints**

TLX Item	Attribute	Value	Required/Prohibited
TLXmediaCount	count	any	Required
TLXmediaCount	rate	any	Required

To comply with this profile when labeling a sequence, the count attribute value shall increment by one for each consecutive media unit of the sequence and the rate attribute shall remain constant throughout the sequence. The count attribute value corresponding to the first media unit of the sequence may be any value.

As specified in ST 2120-2, a two-part time-like value consisting of a count of whole seconds  $w$  and a count of whole media units  $r$  can be determined from the attributes of the TLXmediaCount item of a label conforming to the Time-Like profile.

Note: As indicated in ST 2120-2, when the actual media rate for the sequence is a fixed media rate equal to  $r$ , such a time-like value will represent time, but in other conditions, the representation will merely be time-like.

To comply with this profile within a sequence, the TLXmediaCount item and/or any of the attributes listed in Table 15 may be virtual.

In the case where TLXmediaCount is part of the organizing principle for accessing a sequence, an offset from the TLXmediaCount value can provide an index to address another media unit within that sequence.

## 5.4. Versioning

### 5.4.1. TLX v1 (TLXv1) Profile

#### 5.4.1.1. Purpose

This profile shall be designated by the profile name "TLXv1".

A TLX complying with the TLX v1 profile contains no items or attributes other than those specified by ST 2120-2:202x.

#### 5.4.1.2. Constraints

A TLX compliant with the TLX v1 profile shall conform to the constraints listed in Table 16

**Table 16 — TLX v1 Profile Item Constraints**

TLX Item	Value	Required/Prohibited
TLXptpTimestamp	as constrained by Table 17	Optional
TLXmediaCount	as constrained by Table 17	Optional
TLXuniqueSourceID	as constrained by Table 17	Optional
TLXmediaUnitInterval	as constrained by Table 17	Optional
TLXst12	as constrained by Table 17	Optional
TLXsourceName	as constrained by Table 17	Optional
<other items>	any	Prohibited

**Table 17 — TLX v1 Profile Attribute constraints**

TLX Item	Attribute	Value	Required/Prohibited
TLXptpTimestamp	any specified in ST 2120-2:202x	any	as specified in ST 2120-2:202x
TLXmediaCount	any specified in ST 2120-2:202x	any	as specified in ST 2120-2:202x
TLXuniqueSourceID	any specified in ST 2120-2:202x	any	as specified in ST 2120-2:202x
TLXmediaUnitInterval	any specified in ST 2120-2:202x	any	as specified in ST 2120-2:202x

TLXst12	any specified in ST 2120-2:202x	any	as specified in ST 2120-2:202x
TLXsourceName	any specified in ST 2120-2:202x	any	as specified in ST 2120-2:202x
	<other attributes>	any	Prohibited

## 6 TLX Profile Schemas

A formal JSON schema for the profiles in this document is provided as a convenient test material containing individual profile subschemas usable to assist validation of JSON documents as TLX labels compliant with one or more of those profiles.

This schema is compliant with the December 8, 2020 IETF Internet Draft, *JSON Schema*. In cases where a normative clause of this document and the schema are found to be in conflict, the prose governs.

For the purposes of this document, the symbol  $\$(\text{ROOT})$  is defined to be the root directory in which the test materials are located.

This schema is presented in  $\$(\text{ROOT})/\text{schemas}/\text{smpte-tlx-profiles-2021.json}$  and is self-identified by the item "\$id": "http://smpte-ra.org/schemas/2120-3/2021/smpte-tlx-profiles", the value of which is the IETF RFC 3986 Universal Resource Identifier (URI) that is this schema's canonical identification per IETF RFC 6596.

The .json files located in the directory  $\$(\text{ROOT})/\text{tests}/\text{smpte-tlx-profiles}/$  provide illustrations for how the individual profile subschemas can be used to aid in the validation of JSON documents as TLX labels that are further compliant with one or more of these profiles. Each of these test files includes a composite schema, provided as the value of the "schema": {...} item, which is an example of how profile subschemas can be referenced to provide this validation.

This schema is not intended to validate labels having virtual elements, as described in ST 2120-1 (i.e., where labels, items, or attributes have been omitted). Accordingly, it is required that any label, items, or attributes be completely inferred (i.e., reconstructed) prior to validation.

Note: The JSON Schema language does not detect duplicate names within an object, thus this schema leaves unverified the requirement from SMPTE ST 2120-1 that names in an object be unique.



## Annex A (Informative) Use of TLX Profile JSON Schemas

### A.1 General

A TLX label can be validated against both the TLX Schema, such as the one provided by ST 2120-2 and one or more TLX Profile Schemas. This is one way to ensure that the TLX label is both a valid label and is compliant with the profile(s) of interest.

Such validation can be carried out as separate operations, or under JSON Schema, they can be carried out under the collective "allOf" operator as shown in the following examples.

In the schema `smpte-tlx-profiles-2021.json` (see Section 6), each profile is implemented as a properly identified subschema, such that other schemas can make references to the subschemas individually.

### A.2 Single Profile Use

The following example is a composite schema that validates a putative TLX label as being a valid label conforming to the DBC profile.

```
{
  "$schema": "http://json-schema.org/draft-07/schema",
  "description": "Valid TLX conforming to the DBC profile",
  "type": "object",
  "examples": [
    {
      "TLXptpTimestamp": { "ptpTime": [ 1234567890, 123456789 ] },
      "TLXmediaCount": { "count": 0, "rate": [ 50, 1 ] },
      "TLXuniqueSourceID": { "sourceID": "3ac760e0-e11b-11eb-ba80-0242ac130004" }
    ]
  ],
  "properties": {
    "allOf": [
      { "$ref": "http://smpte-ra.com/schemas/2120-2/2021/smpete-tlx-items" },
      { "$ref":
        "http://smpte-ra.com/schemas/2120-3/2021/smpete-tlx-profiles#$defs/DBC" }
    ]
  }
}
```

### A.3 Profile Composition

The following example is a composite schema that validates a putative TLX label as being a valid label conforming to the DBC and ST12-1 profiles.

```
{
  "$schema": "http://json-schema.org/draft-07/schema",
  "description": "Valid TLX conforming to the DBC and ST12-1 profiles",
  "type": "object",
  "examples": [
    {
      "TLXptpTimestamp": { "ptpTime": [ 1234567890, 123456789 ] },
      "TLXmediaCount": { "count": 180499, "rate": [ 50, 1 ] },
      "TLXuniqueSourceID": { "sourceID": "3ac760e0-e11b-11eb-ba80-0242ac130004" },
      "TLXst12": { "timeAddress": [ 1, 0, 9, 24], "fieldMark": true }
    ]
  ],
  "properties": {
    "allOf": [
      { "$ref": "http://smpte-ra.com/schemas/2120-2/2021/smp-te-tlx-items" },
      { "$ref":
        "http://smpte-ra.com/schemas/2120-3/2021/smp-te-tlx-profiles#$defs/DBC" },
      { "$ref":
        "http://smpte-ra.com/schemas/2120-3/2021/smp-te-tlx-profiles#$defs/ST12-1" }
    ]
  }
}
```

### A.4 Invalid Profile Composition

Users are cautioned that some combinations of profiles contain mutually exclusive constraints and may or may not produce usable results. In one example following, a composite schema validates a putative TLX label as being a valid label conforming to the DBC and TimeOnly profiles. Two required components of the DBC item are excluded by the TimeOnly profile, such that no possible TLX label can be validated.

```
{
  "$schema": "http://json-schema.org/draft-07/schema",
  "description": "Valid TLX conforming to the DBC and TimeOnly profiles",
  "type": "object",
```

```
"examples": [ ],
"properties": {
  "allOf": [
    { "$ref": "http://smpte-ra.com/schemas/2120-2/2021/smp-te-tlx-items" },
    { "$ref":
      "http://smpte-ra.com/schemas/2120-3/2021/smp-te-tlx-profiles#$defs/DBC" },
    { "$ref":
      "http://smpte-ra.com/schemas/2120-3/2021/smp-te-tlx-profiles#$defs/TimeOnly"
    }
  ]
}
```

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