SMPTE-TT Embedded in ID3 for HTTP Live Streaming

draft-smpte-id3-http-live-streaming-00

Abstract

This document describes how the subtitle feature for different languages can be achievable in HTTP Live Streaming output streams. In order to achieve the goal, SMPTE-TT XML files are used to embed into the ID3 tag with user defined languages and text information stored in multiple frames.

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1. Introduction

Apple HTTP Live Streaming supports inclusion of timed metadata in ID3 format, carried in an elementary stream (PES) of MPEG-2 transport stream. The metadata stream will be in the same program as the main program containing video/audio content.

Based on this mechanism, the SMPTE-TT XML files containing subtitle images are tagged by the ID3 tag and are embedded as timed metadata in TS segments according to the Apple HLS Metadata Specification.

2. Conventions Used in This Document

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in RFC-2119 [RFC2119].

In this document, these words will appear with that interpretation only when in ALL CAPS. Lower case uses of these words are not to be interpreted as carrying RFC-2119 significance.

3. ID3 Tag

The ID3 Tag [ID3] contains the description of the subtitle and the content of SMPTE-TT XML files. The user defined text information frame (TXXX) defined in (ID3 tag version 2.3.0) is used when tagging the content.

3.1. User Defined Text Information Frame

The SMPTE-TT XML files containing subtitle images are stored in a complete "User Defined Text Information Frame" (TXXX).

The following attributes are defined:

FRAME HEADER
The value is ID3 Frame header.

TEXT ENCODING
The value is the text encoding byte. It denotes the text encoding used to encode the DESCRIPTION and VALUE field.

DESCRIPTION
The description contains Track Name and Language Descriptor in a text string encoded according to TEXT ENCODING. Track Name refers to a unique identifier of closed caption. Language Descriptor is used according ISO639-1.
E.g. If Track Name = 1, Language Descriptor = eng, the description would be Track:1, Lang:eng.

VALUE
The value is SMPTE-TT XML encoded according to TEXT ENCODING.

4. Presentation Time of Temporal Structuring Element in SMPTE-TT

Temporal structures in SMPTE-TT contain the time information in XML attributes using timeExpression [W3C-TTML-1.0]. The timeExpression MUST be interpreted as relative to the presentation time of containing the ID3 Tag.

5. Examples

5.1. SMPTE-TT Example

```xml
<tt xml:lang="CHI" xmlns="http://www.w3.org/ns/ttml"
xmlns:tmm="http://www.w3.org/ns/ttml#metadata"
xmlns:tts="http://www.w3.org/ns/ttml#style"
  <head />
  <body>
    <div begin="00:00:01:229" end="00:00:02:152" tts:extent="39% 6%"
tts:origin="30% 87%">
      <metadata>
        <smpte:image imagetype="PNG" encoding="Base64">
          iVBO ...
          gg==
        </smpte:image>
      </metadata>
    </div>
    <div begin="00:00:02:199" end="00:00:03:0" tts:extent="20% 6%"
tts:origin="39% 87%">
      <metadata>
        <smpte:image imagetype="PNG" encoding="Base64">
          iVBO ...
        </smpte:image>
      </metadata>
    </div>
  </body>
</tt>
```
6. Security Considerations

Since the protocol relies on HTTP Live Streaming, most of the same security considerations apply. See section 11 of draft-pantos-http-live-streaming-08.

7. IANA Considerations

Same IANA considerations of HTTP Live Streaming apply. See section 10 of draft-pantos-http-live-streaming-08.

8. References

8.1. Normative References


8.2. Informative References

[ID3] ID3.org, "User defined text information frame", <http://www.id3.org/id3v2.3.0#head-29e37534e169ad913deb6a4fee345028f3db7c3f>.

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