EMA's Best Practices for Closed Captioning of Internet Protocol-Delivered Video Programming*

DRAFT – June 12, 2013

The EMA Closed Captions Working Group was created to develop a better understanding of, and appropriate best practices for compliance with, the legal requirements imposed by federal law and regulation for closed captioning of Internet Protocol-delivered video programming and to identify other best practices for the conversion of television closed caption files for transmission over the Internet.

Certification If Captions Are Not Provided

The Twenty-First Century Communications and Video Accessibility Act of 2010 and accompanying regulations promulgated by the Federal Communications Commission require that all full-length video delivered via the internet be able to be viewed with closed captions if the video airs on broadcast or cable television with closed captions on or after the applicable effective date. There are various effective dates for the requirement, which are dependent on whether the video programming is pre-recorded and whether it has been edited for the Internet:

* This document is a working draft and is subject to revision. Participation in the working group should not be considered endorsement of all of the draft recommendations.

No effort is being made by EMA or the EMA Digital Council to in any way obligate any market participant to adhere to the Best Practices for Closed Captioning of Internet Protocol-Delivered Video Programming. Whether to utilize the Best Practices for Closed Captioning of Internet Protocol-Delivered Video Programming in whole or in part is left entirely to the individual discretion of individual market participants, using their own independent business judgment. Moreover, EMA and the EMA Digital Council disclaim any warranty or representation as to the suitability of the Best Practices for Closed Captioning of Internet Protocol-Delivered Video Programming for any purpose, and any liability for any damages or other harm you may incur as a result of utilizing them.

- September 30, 2012, for all prerecorded programming that is not edited for Internet distribution;
- March 30, 2013, for all live and "near-live" programming [programming that is performed and recorded within 24 hours prior to its initial airing on television];
- September 30, 2013, for all prerecorded programming that is edited for Internet distribution.

There are special rules for video programming that is already in the library of the video programming provider/distributor before it is shown on television with closed captions. Starting in March 2014, those videos must be captioned within 45 days of being shown on television with captions. The window is reduced to 30 days in 2015 and 15 days in 2016.

The regulations do not cover user-generated content (unless that content is included in the video programming as broadcast on television).

The content licensor ("video programming owner") is to provide the closed captioning file to the online video service ("video programming distributor" or "video programming provider"). The content licensor and the online video service are to establish a mechanism for ongoing communication whether a particular video is covered by the closed captioning requirement, and the online video service must make a "good faith effort" to identify covered programming using that mechanism. An online video service is entitled to rely on a certification from the content provider that a particular video is not subject to the closed captioning requirement.

Recommended Best Practice:

If a closed caption file is not provided for intended IP-delivered video programming, the video programming owner should include the following in both the avails and the metadata for that programming:

[Partner name] certifies that captions are not required for this video upload because:

- ☐ *This content has never aired on television in the U.S.*
- ☐ *This content has only aired on television in the U.S. without captions.*
- ☐ *This content has not aired on U.S. television with captions since September 30, 2012*
- ☐ *This content does not consist of full-length video programming.*
- ☐ *This content does not fall within a category of online programming that currently requires captions under FCC regulations (49 C.F.R. § 79.4(b)).*
- ☐ *The FCC and/or U.S. Congress has granted an exemption from captioning requirements for this content.*

Preferred Captioning Formats

In order for a broadcast video to be delivered over the Internet with closed captions, the closed caption file must be converted from the CEA-608 protocol used for television closed captions to a format suitable for Internet delivery (of which there are several), after which the captions can be edited to display properly. This conversion and editing can be done manually (extremely difficult and time-consuming), from scratch (very expensive), or by using software to extract and reformat the captioning data (preferred).

Even with closed captioning software, conversion can be challenging, especially when it involves a broadcast closed caption file in a legacy format.

Recommended Best Practice:

It is desirable to have the closed caption file delivered in a format that is relatively easy to extract and reformat. Delivery of closed caption files in SCC format (with a .scc file extension) is preferred at this time.

- SCC contains the CEA-608 information that is needed, is very concise, and is (almost entirely) unambiguous with a .scc file extension. It is also widely used and well understood by all captioning software.

Also accepted are the following TTML formats:

SMPTE-TT (Recommended Practice 2052) (with a .xml file extension)

DFXP Full/Timed Text Markup Language (with a .dfxp file extension)

Please note, however:

- Using TTML markup carries some risk of inoperability, even with Recommended Practice 2052. We suggest only "pop-on" captions be used (regions pop1-4) to help simplify matters.
- Using the mechanism described in 5.10 of https://www.smpte.org/sites/default/files/rp2052-10-2012.pdf to "tunnel" CEA-608 data will result in unambiguous behavior. If we see this data, we may use it in preference to the other markup.
- Using arbitrary TTML as defined by http://www.w3.org/TR/ttaf1-dfxp/ without reference to Recommended Practice 2052 is strongly discouraged.

Other formats are not preferred because either they are proprietary and not open source or they present technical issues (*e.g.*, they do not support positioning).

Frame Rates

Closed caption data files are separate from the video data files. Ideally, the caption frame rate

should match the native frame rate of the source. However, they often do not, and synchronization of the two can be a problem.

Television in North America is generally broadcast at a standard rate of 29.97 frames per second (FPS). Internet video delivery, however, can support a variety of frame rate formats, and a number of distributors of IP-delivered video programming require films and TV shows to be at a frame rate of 23.976 or 25 FPS.

These varying frame rate requirements mean that the closed caption files that were created for North American broadcast will not match the Internet video frame rate. As a result, the frame rate of the caption file must be reconfigured to the frame rate utilized by the Internet video content distributor (such as 23.976 FPS), and if necessary, the time code must be stretched or shrunk.

This can be a challenge for a number of reasons. In many cases, the caption file has SMPTE-based timestamps and fails to specify the frame rate. In such cases, one has to guess the frame rate until the correct frame rate is identified. In other cases, the video has been transcoded to a slightly different frame rate, or the captions were generated using a differently transcoded or edited version of the video.

To address this issue, some Internet video content distributors require the content provider to provide a closed caption data file that is already synchronized to the video data file. Others have developed processes to fix the caption files in-house.

Recommended Best Practice:

If the Internet video content distributor does not require the closed caption data file to be

already synchronized to the video data file, the closed caption data file may be submitted in any frame rate in which it was created, so long as the frame rate is clearly indicated in the file name, metadata, or code.

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