White Paper

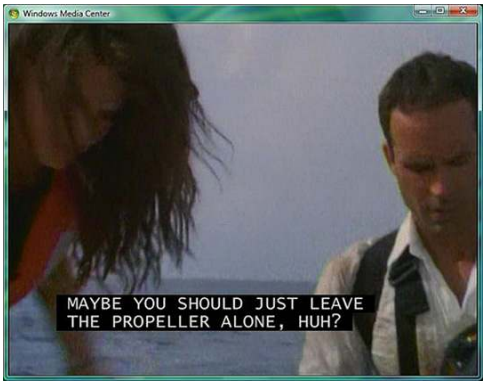
Closed Captions: Solution to Generate Captions for Video-on-Demand and Live Applications

What You Will Learn

Closed captioning allows people who are hearing impaired, who actively select to read a language on a screen, or are in a noisy environment (such as a bar or an airport) to read a transcript of the audio component of a video or broadcast. As the video plays, text captions that transcribe the speech are displayed—although not always as a precise representation of what is being said on screen.

The term “closed” in closed captions means that not all viewers see the captions—only those who decode or activate them. Closed captions are different from “open captions”, where all viewers see the captions because they are permanently “burned” into the video image.

Closed captioning provides a critical link to news, entertainment, and other information for individuals who need them and is therefore required by law in the United States. Since 1996, Congress has required all video programming distributors (cable operators, broadcasters, satellite distributors, etc.) to provide closed captions with their television programs. Distributors who do not provide accurate captioning information may be fined by the FCC.



Additionally, in late 2010, President Obama signed into law the 21st Century Communications and Video Accessibility Act, which added a definition for video programming to include programming provided by—or generally considered comparable to programming provided by—a television broadcast station, even when distributed over the Internet. It tasks the FCC with creating captioning rules for three types of television-like programming on the Internet:

- Pre-produced programming that was previously captioned for television viewing
- Live television-like video programming
- New programming provided by—or generally considered to be comparable to programming provided by—multichannel programming distributors (such as cable or satellite subscription TV services)

This act is intended to ensure the continued accessibility of video programming to Americans with disabilities as this programming migrates to the Internet. Although the FCC has not yet developed these rules, it is important that content owners and broadcasters can ensure that accurate closed-captioning data is added or preserved as video and encoded for delivery.

In the United Kingdom and other countries, there is no distinction between subtitles and closed captions. Outside the United States, the term ”subtitles” is generally the operative term, and the equivalent of what we call captioning in the United States is usually referred to as ”subtitles for the hard of hearing”. The presence of closed captions is referenced on screen by a notation that says “Subtitles”, or previously “Subtitles 888”, or just “888” (the latter two are in reference to the conventional teletext channel for captions).

How Captioning Works

The following questions and answers should help you in the understanding of how the closed captioning technology works:

The Cisco Captioning Solution

Cisco’s digital media preparation products provide some of the most comprehensive closed captioning and teletext inclusion capabilities on the market. Cisco® Transcode Manager products enable the preservation of existing captions and teletext data on tape and in files as additional raw data from external files. For live broadcasts, the Cisco Media Processor product line enables the recognition of EIA-608 (for standard-definition [SD] signals) and CEA-708 (for high-definition [HD] signals) captions in the appropriate data stream in a broadcast, and displays captions, subtitles, and teletext as appropriate. Cisco Transcode Manager TM does not support Teletext or capture from tape.

Where does the caption or teletext data come from?

Captions in live signals appear in different manifestations, depending on whether the signal is SD or HD. For SD, a data field called Line 21 exists in the television signal. This area of the picture is a non-visible area that houses this and other information. When broadcast television became digitally transmitted, captioning changed. For HD signals, closed captions are injected into MPEG-2 video streams in the picture user data. In both cases, the Cisco Media Processor can see this data, interpret it, and pass it along as part of the streamed output. For on-demand processing of content, Cisco Transcode Manager can acquire existing captioning data from the source tape, media file, or standalone files without additional hardware or software.

How do captions reach the TV?

In broadcast television, closed captioning is activated by a decoder connected to the TV or by a built-in decoder chip. In IPTV environments, closed captions are embedded as metadata with the video stream, requiring no additional network setup or streams. This embedded metadata is then decoded by a set-top box in IPTV architectures.

How do captions reach non-television screens?

Adobe Flash supports captions through the Timed Text DFXP .XML format. These captions can be turned on or off from within the player itself.

Microsoft's Windows Media and Smooth Streaming can support closed captions for both video-on-demand (VoD) streaming or live streaming scenarios. Typically Smooth and Windows Media captioning support the SAMI file format but can also carry embedded closed caption data.

Apple® QuickTime supports true 608 caption data through QuickTime and CoreMedia's (Snow Leopard OS and later) proprietary Closed Caption Track. These captions can be turned on and off, and they appear in the same style as television closed captions with the entire standard formatting (pop-on, roll-up, paint-on); they can be positioned and split anywhere on the video screen. You can view QuickTime closed caption tracks in Mac or Windows versions of QuickTime player, iTunes, and the QuickTime web browser plug-in, as well as on your iPod and iPhone® devices.

In summary, the various compression technologies (Microsoft Smooth Streaming, Adobe Dynamic Flash, and Apple® QuickTime) that our product lines support all offer different ways to render closed captions across multiple devices. The user interfaces for each of our products have extensive settings and features for the inclusion of this data, and our user manuals explain all of these options in depth.

For More Information

For more information about the Cisco solution for closed captioning, please refer to Cisco Media Processor Family page or contact your local Cisco account manager.

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