

Disability Standards for Multimedia on the Web

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This article shows how the Web Content Accessibility Guidelines adopted by several countries could be applied to make multimedia content accessible to those with special needs.

In the context of video interaction there is a diversity of options—such as different browsers, players, and assistive technologies—for disabled people who want to access the Web. However, new developments for the Web that don't account for accessibility issues increase the digital divide and add barriers to access for all people, not just for those with special needs. To sort out such accessibility issues, the World Wide Web Consortium promoted a Web Accessibility Initiative (WAI)—see <http://www.w3.org/WAI/-in> 1999 to promote publication of the *Web Content Accessibility Guideline 1.0* (WCAG 1.0).¹

While international accessibility legislation offers different approaches to protect the rights of disabled people, the WCAG 1.0 is the most referenced and applied standard. The WAI includes working groups to produce technical specifications that support accessibility such as *User Agent Accessibility Guidelines* and *Authoring Tool Accessibility Guidelines*, which are important in the realm of multimedia. This article offers an overview for evaluating and designing multimedia content according to the evolving WCAG standards, including the forthcoming WCAG 2.0 standard.

Standards

The WCAG 1.0 includes 14 guidelines with a total of 65 checkpoints. Each checkpoint has

a priority level for Web developers to meet: priority one, two, and three. Regarding the fulfilment of these checkpoints, a Web site can have an A, AA, or AAA level of conformance. The priority levels are designed to indicate a Web site's level of accessibility, with A being the lowest and AAA being the highest.

Although the WCAG 1.0 is the current standard, the WCAG 2.0 is expected to replace it. A candidate recommendation draft—with minor changes—should be the definitive version before the end of 2008.² The WCAG 2.0 is built on four basic principles of accessibility: perceivable, operable, understandable, and robust. Within these principles, there are 12 guidelines that contain success criteria. The WCAG 2.0 does not use priority levels, but each success criterion is assigned one of three defined levels of conformance (A, AA, AAA), much like WCAG 1.0. Table 1 shows a proposal for the corresponding WCAG 2.0 multimedia success criteria and specific techniques for each WCAG 1.0 checkpoint.

Accessibility chain

To supply accessible multimedia content on the Web, we must account for a chain of links: first, the multimedia content must be accessible itself; second, once the Web page includes the multimedia content, the page must still be accessible; and finally, the interaction with the user must be accessible.

Accessible video

The first link of the chain makes the content accessible. The multimedia content must be accessible by providing synchronized alternatives, such as subtitles, audio, transcripts, and so on. The WCAG 1.0 is less restrictive than the WCAG 2.0 for multimedia content. The WCAG 2.0 demands more alternative content (captions, audio descriptions, extended audio descriptions, and sign-language interpretation) to achieve different levels of accessibility as indicated in Table 1.

The techniques for WCAG 1.0 document is outdated compared to the current technology. Therefore, it's useful to refer to the *Techniques for WCAG 2.0* document. Table 1 shows the different techniques that we would need when designing accessible multimedia content using current technology according to the WCAG—some methods are WCAG 2.0 techniques (G68, G78, G8, G93, G87, G69, G78, G9,

Table 1. Checklist of accessibility to multimedia content on the Web following the Web Content Accessibility Guideline.

Checklist	WCAG 1.0 checkpoints	WCAG 1.0 priority levels	WCAG 2.0			
			WCAG 2.0 success criteria	conformance levels	WCAG 2.0, SMIL, and other techniques	
Multimedia content	1.1	1	1.1.1 nontext content	A	G68	
			1.2.1 audio and video only (prerecorded)	A	G158, G159	
			1.2.9 live audio-only	AAA	G150, G157	
	1.3	1	1.2.5 audio description	AA	G78, SM6, SM7	
			1.2.7 audio description (ext.)	AAA	G8, SM1, SM2	
	1.4	1	1.2.2 captions (prerecorded)	A	G93, G87, SM11, SM12	
			1.2.3 audio description or full text alternative	A	G69, G78	
			1.2.4 captions (live)	AA	G9, G93	
			1.2.5 audio description	AA	G78	
			Audio description (extended)	AAA	G8	
			1.2.8 alternative full text	AAA	G69, G159	
	No mapping			1.2.6 sign language	AAA	G54, G81, SM13, SM14
	Web access to multimedia content	13.1	2	2.4.4 link purpose (in context)	A	G91, G53
2.4.9 link purpose (link only)				AAA	G91, C7	
6.3		1	No direct mapping	A	H46, H53, object	
No mapping		4.1.2 name, role, value	A	G10, G108, 135		
User interface design for multimedia content	14.1	1	No direct mapping but consider 3.1.5 reading level	AAA	G86, G103, G79, language	
	11.3	3	No direct mapping but consider 2.2.2 pause, stop, hide	A	G4, G11, universal design	

G93, G78, G8, 69, G157, G158, G159) and some are Synchronized Multimedia Integration Language (SMIL) techniques (SM6, SM1, SM11, and so on).

Accessible Web page

The next link in the chain is how to include video on a Web page. Although the video resource might be accessible, the way to get to that resource might have accessibility barriers. Options for delivering video on a Web page include download (file transfer), progressive download, and streaming. These options present less difficulty and fewer accessibility validation problems when only including a simple link to the video in the Web page's code. This link must be labelled following WCAG 1.0 checkpoints (13.1) and/or WCAG 2.0 success criteria (2.4.4, 2.4.9), as Table 1 shows.

The progressive download option leads to implementation difficulties when following the WCAG 1.0 guidelines. Its reproduction not only depends on video format or user agent, but also leads to exceptions caused by

the conflict between standards and software. The most common method to include multimedia content on a Web site is using the <embed> element. HTML 4.01 does not include this option and the WCAG 1.0 states that it isn't accessible. Although HTML 5.0 does include the <embed> option, it's preferable to use the <object> element of XHTML to add multimedia, thereby fulfilling the WCAG 1.0 guideline. However, this solution has a problem: some Web browsers aren't able to interpret this element correctly.

The WCAG 1.0 techniques are not helpful in this case, but the WCAG 2.0 techniques provide some solutions and interesting references in the documentation on the H46 and H53 techniques. However, these techniques are explicitly for exceptional situations. In these situations, developers have created techniques—we call these solutions *object techniques* in Table 1—for solving these problems.³

Accessible user interaction

Finally, access to the video must be intuitive, showing access and control information

to the user. Checkpoint 14.1 could be applicable according to the WCAG 1.0 standard, which indicates the use of a straightforward language. We recommend following design techniques focused on the user, whereby the user participates in the elaboration of the content and applies easy-to-read rules. We call these *language techniques* in Table 1.

For users to gain access to the video in accordance with his or her requirements, we must account for factors such as the video's size and length, progress of the video reproduction, user connection speed and type, user agent associated with the reproduction, video format, user control of the playback, and so on. Even though checkpoint 11.3 of the WCAG 1.0 could apply in this case, the WCAG 2.0 does not map directly to the related WCAG 1.0 checkpoints. The WCAG 2.0 success criteria are considered as 3.1.5 (reading level) or 2.2.2 (pause, stop, and hide).

Besides offering the previously mentioned information to the user, we must consider how to present that information. As with the techniques mentioned previously, we apply the universal design principles⁴ and usability criteria in the Web interface. We label these principles and criteria *universal design techniques* in Table 1.

Conclusion

Ultimately, the designer will decide which option to use for including multimedia content on a Web page, but his or her objective must be accessibility in all its dimensions to reach as many users as possible. **MM**

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