HTML5 video

The **HTML5** draft specification introduced the **video element** for the purpose of playing videos or movies, partially replacing the object element. HTML5 video is intended by its creators to become the new standard way to show video on the web without plugins, but has been hampered by lack of agreement as to which video formats should be supported in web browsers.

==History of </source> The "controls" attribute enables the browser's own user interface for controlling playback. Alternatively, playback can be controlled with JavaScript, which the web designer can use to create a custom user interface. The optional "poster" attribute specifies an image to show in the video's place before playback is started. Its purpose is to be representative of the video.

Multiple sources

Video format support varies among browsers (see below), so a web page can provide video in multiple formats. For other features, browser sniffing is used sometimes, which may be error prone: any web developer's knowledge of browsers will inevitably be incomplete or not up-to-date. The browser in question "knows best" what formats it can use. The "video" element supports fallback through specification of multiple sources. Using any number of <source> elements, as shown below, the browser will choose automatically which file to download. Alternatively, the JavaScript canPlayType() function can be used to achieve the same. The "type" attribute specifies the MIME type and possibly a list of codecs, which helps the browser to determine whether it can decode the file. Even with only one choice, such hints may be necessary to a browser for querying its multimedia framework for third party codecs.

```
<video poster="movie.jpg" controls>
      <source src="movie.webm" type='video/webm; codecs="vp8.0, vorbis"'>
      <source src="movie.ogg" type='video/ogg; codecs="theora, vorbis"'>
      <source src="movie.mp4" type='video/mp4; codecs="avc1.4D401E, mp4a.40.2"'>
      <p>This is fallback content</p>
</video>
```

Supported video formats

The current HTML5 draft specification does not specify which video formats browsers should support. User agents are free to support any video formats they feel are appropriate, but content authors cannot assume that any video will be accessible by all complying user agents, since user agents have no minimal set of video formats to support.

The HTML5 Working Group considers it desirable to specify at least one video format which all user agents (browsers) should support. The ideal format in this regard would:

- Have good compression, good image quality, and low decode processor use.
- Be royalty-free.
- In addition to software decoders, a hardware video decoder should exist for the format, as many embedded processors do not have the performance to decode video.

Initially, Ogg Theora was the recommended standard video format in HTML5, because it was not affected by any known patents. But on December 10, 2007, the HTML5 specification was updated, replacing the reference to concrete formats:

> User agents should support Theora video and Vorbis audio, as well as the Ogg container format.

with a placeholder:

> It would be helpful for interoperability if all browsers could support the same codecs. However, there are no known codecs that satisfy all the current players: we need a codec that is known to not require

> per-unit or per-distributor licensing, that is compatible with the open source development model, that is of sufficient quality as to be usable, and that is not an additional submarine patent risk for large companies. This is an ongoing issue and this section will be updated once more information is available.

The result has been the polarisation of HTML5 video between industry-standard, ISO-defined but patented formats, and free, open formats.

Free formats

Although Theora is not affected by known non-free patents, Apple has expressed concern about unknown patents that might affect it, whose owners might be waiting for a corporation with extensive financial resources to use the format before suing. Formats like H.264 might also be subject to unknown patents in principle, but they have been deployed much more widely and so it is presumed that any patent-holders would have already made themselves known. Apple has also opposed requiring Ogg format support in the HTML standard (even as a "should" requirement) on the grounds that some devices might support other formats much more easily, and that HTML has historically not required particular formats for anything.

Some web developers criticized the removal of the Ogg formats from the specification. A follow-up discussion also occurred on the W3C questions and answers blog.

Mozilla and Opera support only the open formats of Theora and WebM. Google stated its intention to remove support for H.264 in 2011, specifically for the HTML5 video tag. Although it has been removed from Chromium, it has yet to be removed from Google Chrome over a year later.

Google purchase of On2

Google's acquisition of On2 in 2010 resulted in its acquisition of the VP8 video format. Google has provided a royalty-free license to use VP8. Google also started WebM, which combines the standardized open source VP8 video codec with Vorbis audio in a Matroska based container. The opening of VP8 was welcomed by the Free Software Foundation.

When Google announced in January 2011 that it would end native support of H.264 in Chrome, criticism came from many quarters including Peter Bright of Ars Technica and Microsoft web evangelist Tim Sneath, who compared Google's move to declaring Esperanto the official language of the United States. However, Haavard Moen of Opera Software strongly criticized the Ars Technica article and Google responded to the reaction by clarifying its intent to promote WebM in its products on the basis of openness.

After the launch of WebM, Mozilla and Opera have called for the inclusion of VP8 in HTML.

On March 7, 2013, Google Inc. and MPEG LA, LLC announced agreements covering techniques that "may be essential" to VP8, with Google receiving a license from MPEG LA and 11 patent holders, and MPEG LA ending its efforts to form a VP8 patent pool.[1][2]

Non-free formats

H.264/MPEG-4 AVC is widely used, and has good speed, compression, hardware decoders, and video quality, but is patent-encumbered. Users of H.264 need licenses either from the individual patent holders, or from the MPEG LA, a group of patent holders including Microsoft and Apple, except for some Internet broadcast video uses. H.264 is usually used in the MP4 container format, together with Advanced Audio Coding (AAC) audio. AAC is also patented in itself, so users of MP4 will have to license both H.264 and AAC.

In June 2009, the WHATWG concluded that no existing format was suitable as a specified requirement.

Apple and Microsoft support only H.264.

Cisco makes a licensed H.264 binary module available for free

On October 30, 2013, Cisco announced that they were making a binary H.264 module available for download. Cisco will pay the costs of patent licensing for those binary modules *when downloaded by the using software while it is being installed*, making H.264 free to use in that specific case.[3]

In the announcement, Cisco cited its desire of furthering the use of the WebRTC project as the reason, since WebRTC's video chat feature will benefit from having a video format supported in all browsers. The H.264 module will be available on "all popular or feasibly supportable platforms, which can be loaded into any application".

Cisco is also planning to publish source code for those modules under BSD license, but without paying the royalties, so the code will practically be free software only in countries without H.264 software patents, which has already been true about other existing implementations.

Also on October 30, 2013, Mozilla's Brendan Eich announced that Firefox would automatically download Cisco's H.264 module when needed by default. He also noted that the binary module is not a perfect solution, since users do not have full free software rights to "modify, recompile, and redistribute without license agreements or fees". Thus Xiph and Mozilla continue the development of Daala.

The release concerns only H.264 video and not AAC audio formats, since "the standards bodies have aligned on Opus and G.711 as the common audio codecs for WebRTC". So software to play MP4 video (H.264+AAC) is still not freely (as in beer) available, and there is doubt as to whether a capped global licensing like like Cisco's for H.264 can be created.[4]

Browser support

This table shows which video formats are *likely* to be supported by a given user agent. Most of the browsers listed here use a multimedia framework for decoding and display of video, instead of incorporating such software components. It is not generally possible to tell the set of formats supported by a multimedia framework without querying it, because that depends on the operating system and third party codecs. In these cases, video format support is an attribute of the framework, not the browser (or its layout engine), assuming the browser properly queries its multimedia framework before rejecting unknown video formats. In some cases, the support listed here is not a function of either codecs available within the operating system's underlying media framework, or of codec capabilities built into the browser, but rather could be by a browser add-on that might, for example, bypass the browser's normal HTML parsing of the <video> tag to embed a plug-in based video player.

The video format can be specified by MIME type in HTML (see example). MIME types are used for querying multimedia frameworks for supported formats.

Of these browsers, only Firefox and Opera employ libraries for built-in decoding. In practice, Internet Explorer and Safari can also guarantee certain format support, because their manufacturers also make their multimedia frameworks. At the other end of the scale, Konqueror has identical format support to Internet Explorer when run on Windows, and Safari when run on Mac, but the selected support here for Konqueror is the typical for GNU/Linux, where Konqueror has most of its users. In general, the format support of browsers is much dictated by conflicting interests of vendors, specifically that Media Foundation and QuickTime support commercial standards, whereas GStreamer and Phonon cannot legally support other than free formats by default on the free operating systems that they are intended for.

Browser	Operating system	Latest stable release	Video formats supported			
			Theora	H.264 (MP4)	VP8 (WebM)	VP9 (WebM)
Android browser	Android	4.2.1 "Jelly Bean" (November 27, 2012) [±] [5]	2.3	3.0	2.3	No
Chromium	All supported	N/A	r18297	Manual install[6] </ref>	r47759	r172738[7]
Google Chrome	Windows 33.0.1750.154 (March 14, 2014) [±] [8] Mac OS X & Linux 33.0.1750.152 (March 14, 2014) [±] [8]		3.0	3.0[9] As of 8 September 2012[10] neither actual support was removed, nor the change to this plan was announced.</ref>	6.0	29.0[11] Enabled by default in version 29.</ref>
Internet Explorer	Windows	v11.0.9600.16521 (11.0.4) (11 March 2014) [±] [12]	Manual install[13] </ref>	9.0	Manual install[14]</ref>	No
	Windows Phone	10.0 (November 21, 2012) [±] [15]	No	9.0	No	
	Windows RT	10.0		10.0		
Konqueror	All supported	4.12.3 (4 March 2014) [±] [16]	4.4[17] Any format supported by Phonon backend. Available Phonon backends include DirectShow, QuickTime, GStreamer and xine; backends using MPlayer and VLC are in development.</ref>			No
Mozilla Firefox	Windows 7+	28.0 (March 18, 2014) [±] [18] ESR 24.4.0 (March 18, 2014) [±] [18]	3.5	21.0[19] Enabled by default beginning in version 21.</ref>	4.0	28.0[20]
	Windows Vista			22.0		
	Linux			26.0 (using GStreamer)[21] Also, depends on the codec on the system.</ref>		
	Android			17.0[22]		
	All other supported			No		
Opera	20 for Android (March 18, 2014) [±] [23] 12.0.22 for Symbian S60 (June 24, 2012) [±] [23] 10.0 for Windows Mobile (March 16, 2010) [±] [23]		No	11.50	15.0	16.0
	Windows, OS X 20.0.1387.91 (April 2, 2014) [±] [24] Linux, FreeBSD 12.16 (July 4, 2013) [±] [24]		10.50	No	10.60	No

Safari	iOS	7.0.3 (April 1, 2014) [±] [25] 6.1.3 (April 1, 2014) [±] [25]	No	3.1	No	No
	OS X		Manual install[26]		Manual install	
Web (previously Epiphany)	All supported	3.12 (March 26, 2014) [±] [27]	2.28[28] The support for Ogg Theora, WebM and h.264 formats is included with base, good, and bad plugins respectively.</ref>			No

Notes

[1] http://www.mpegla.com/Lists/MPEG%20LA%20News%20List/Attachments/88/n-13-03-07.pdf
[2] http://www.fosspatents.com/2013/03/patent-clouds-remain-over-vp8-google.html
[3] http://www.openh264.org/faq.html
[4] http://xiphmont.livejournal.com/63152.html
[5] http://en.wikipedia.org/w/index.php?title=Template:Latest_stable_software_release/Android_(operating_system)&action=edit
[6] Third-party codec packages are available.<ref>
[7] http://src.chromium.org/viewvc/chrome?view=rev&revision=172738
[8] http://en.wikipedia.org/w/index.php?title=Template:Latest_stable_software_release/Google_Chrome&action=edit
[9] On 11 January 2011 the removal of support for H.264 was announced on Chromium Blog.<ref>
[10] http://en.wikipedia.org/w/index.php?title=HTML5_video&action=edit
[11] VP9 support in 25, turned off by default.<ref>
[12] http://en.wikipedia.org/w/index.php?title=Template:Latest_stable_software_release/Internet_Explorer&action=edit
[13] Third-party codec packages are available.<ref>
[14] Possible if the user has installed a VP8 codec on Windows for IE9.<ref name= "googleplugin">
[15] http://en.wikipedia.org/w/index.php?title=Template:Latest_stable_software_release/Internet_Explorer_Mobile&action=edit
[16] http://en.wikipedia.org/w/index.php?title=Template:Latest_stable_software_release/KDE_Software_Compilation_4&action=edit
[17] Any format supported by Phonon on Qt 4.5.<ref>
[18] http://en.wikipedia.org/w/index.php?title=Template:Latest_stable_software_release/Firefox&action=edit
[19] As of version 20, prefed off by default.<ref>
[20] http://www.mozilla.org/en-US/firefox/28.0/releasenotes/
[21] Disabled by default until version 26.<ref>
[22] http://arstechnica.com/information-technology/2012/11/mozilla-ships-firefox-with-h-264-support-on-android/
[23] http://en.wikipedia.org/w/index.php?title=Template:Latest_stable_software_release/Opera_Mobile&action=edit
[24] http://en.wikipedia.org/w/index.php?title=Template:Latest_stable_software_release/Opera&action=edit
[25] http://en.wikipedia.org/w/index.php?title=Template:Latest_stable_software_release/Safari&action=edit
[26] Supported if XiphQT is installed.
[27] http://en.wikipedia.org/w/index.php?title=Template:Latest_stable_software_release/GNOME&action=edit
[28] Any format supported by GStreamer on Webkit/GTK+.<ref name="epiphany-webkit-announcement">

Usage

As of April 2010 (http://en.wikipedia.org/w/index.php?title=HTML5_video&action=edit), in the wake of Apple iPad launch, a number of high-profile sites have started to serve H.264 HTML5 video instead of Flash for user-agents identifying as iPad.

As of May 2010 (http://en.wikipedia.org/w/index.php?title=HTML5_video&action=edit), HTML5 video is not currently as widespread as Flash videos, though recent rollouts of experimental HTML5-based video players from DailyMotion (using Ogg Theora and Vorbis format), YouTube (using the H.264 and WebM formats), and Vimeo (using the H.264 format) suggest that interest in adopting HTML5 video is increasing.

Some major video-providing websites have announced decisions to continue using technologies other than HTML5 video. According to a YouTube blog post from June 2010, the <video> tag "does not currently meet all the needs of a website like YouTube". The main reasons stated include the lack of a standard format, the absence of an effective and reliable means of delivering the video to the browser, JavaScript unable to display video fullscreen, and content protection issues. Hulu also has not adopted HTML5 video due to the inability of providing the user with adaptive bandwidth videos, securing the producer's content, and providing advertisers with data. Netflix stated that there are a

number of issues preventing them from using HTML5 video: acceptable A/V container formats; acceptable audio and video codecs; streaming protocol; a way for the streaming protocol to adapt to available bandwidth; a way of conveying information about available streams and other parameters to the streaming player module; a way of supporting protected content; and a way of exposing all this functionality into HTML5.

On January 11, 2011, Google's Chromium Project announced on their blog that support for closed codecs (particularly H.264) would be removed from future releases of Chrome. The Chromium announcement specifically mentioned that this removal was an effort to increase the use of license-free HTML5 and the <video> tag, driving web-wide adoption of the open-source codecs VP8 and Theora. On February 2, 2011 Microsoft released the Windows Media Player HTML5 Extension for Chrome for Windows 7 which added the ability to use the licensed H.264 player included with Windows 7 to play back H.264 media content using Chrome.

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External links

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