

Windows Media Video

Windows Media Video (**WMV**) is a series of video codecs and their corresponding video coding formats developed by Microsoft. It is part of the Windows Media framework. WMV consists of three distinct codecs: The original video compression technology known as *WMV*, was originally designed for Internet streaming applications, as a competitor to RealVideo. The other compression technologies, *WMV Screen* and *WMV Image*, cater for specialized content. After standardization by the Society of Motion Picture and Television Engineers (SMPTE),^{[1][2]} WMV version 9 was adapted for physical-delivery formats such as HD DVD and Blu-ray Disc and became known as VC-1.^{[3][4]} Microsoft also developed a digital container format called Advanced Systems Format to store video encoded by Windows Media Video.

Contents

History

Container format

Video compression formats

Windows Media Video

Windows Media Video Screen

Windows Media Video Image

Versions

Audio compression formats

Players

Encoders

Digital rights management

Criticism

See also

References

External links

History

In 2003, Microsoft drafted a video compression specification based on its WMV 9 format and submitted it to SMPTE for standardization. The standard was officially approved in March 2006 as SMPTE 421M, better known as VC-1, thus making the WMV 9 format an open standard. VC-1 became one of the three video formats for the Blu-ray video disc, along with H.262/MPEG-2 Part 2 and H.264/MPEG-4 AVC.^{[3][4]}

Container format

A *WMV file* uses the Advanced Systems Format (ASF) container format to encapsulate the encoded multimedia content. While the ASF can encapsulate multimedia in other encodings than those the WMV file standard specifies, those ASF files should use the `.asf` file extension and not the `.wmv` file extension.^[5]

The ASF container can optionally support digital rights management using a combination of elliptic curve cryptography key exchange, DES block cipher, a custom block cipher, RC4 stream cipher and the SHA-1 hashing function.

Although WMV is generally packed into the ASF container format, it can also be put into the Matroska^[6] container format (with file extension .mkv), or AVI container format (extension .avi). One common way to store WMV in an AVI file is to use the WMV 9 Video Compression Manager (VCM) codec implementation.^{[7][8]}

Video compression formats

Windows Media Video

Windows Media Video (WMV) is the most recognized video compression format within the WMV family. Usage of the term WMV often refers to the Microsoft Windows Media Video format only. Its main competitors are MPEG-4 AVC, AVS, RealVideo, and MPEG-4 ASP. The first version of the format, WMV 7, was introduced in 1999, and was built upon Microsoft's implementation of MPEG-4 Part 2.^[9] Continued proprietary development led to newer versions of the format, but the bit stream syntax was not frozen until WMV 9.^[10] While all versions of WMV support variable bit rate, average bit rate, and constant bit rate, WMV 9 introduced several important features including native support for interlaced video, non-square pixels, and frame interpolation.^[11] WMV 9 also introduced a new profile titled *Windows Media Video 9 Professional*,^[12] which is activated automatically whenever the video resolution exceeds 300,000 pixels (e.g., 528 px × 576 px, 640 px × 480 px or 768 px × 432 px and beyond) and the bitrate 1000 kbit/s. It is targeted towards high-definition video content, at resolutions such as 720p and 1080p.

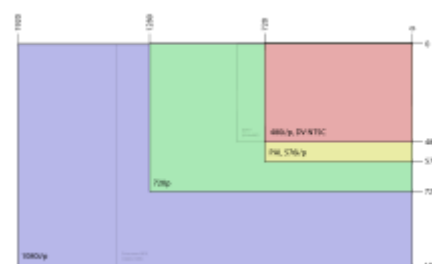


Diagram illustrating the relative frame sizes of several common video resolutions targeted by Windows Media Video 9 Professional, starting with 480p.

The *Simple* and *Main* profile levels in WMV 9 are compliant with the same profile levels in the VC-1 specification.^[13] The *Advanced Profile* in VC-1 is implemented in a new WMV format called *Windows Media Video 9 Advanced Profile*. It improves compression efficiency for interlaced content and is made transport-independent, making it able to be encapsulated in an MPEG transport stream or RTP packet format. The format is not compatible with previous WMV 9 formats, however.^[14]

WMV is a mandatory video format for PlaysForSure-certified online stores and devices, as well as Portable Media Center devices. The Microsoft Zune, Xbox 360, Windows Mobile-powered devices with Windows Media Player, as well as many uncertified devices, support the format.^[15] WMV HD mandates the use of WMV 9 for its certification program, at quality levels specified by Microsoft.^[16] WMV used to be the only supported video format for the Microsoft Silverlight platform, but the H.264 format is now also supported starting with version 3.^[17]

Windows Media Video Screen

Windows Media Video Screen (WMV Screen) are video formats that specialise in screencast content. They can capture live screen content, or convert video from third-party screen-capture programs into WMV 9 Screen files. They work best when the source material is mainly static and contains a small color palette.^[18]

One of the uses for the format is computer step-by-step demonstration videos. The first version of the format was WMV 7 Screen. The second version, WMV 9 Screen, supports VBR encoding in addition to CBR.^[18] Additionally there is MSA1 (aka “MS ATC Screen codec” or “MSS3”) which is used in Live Meeting 2007. FourCCs for the formats are MSS1, MSS2 and MSA1.^[19]

Windows Media Video Image

Windows Media Video Image (WMV Image) is a video slideshow format. The format works by applying timing, panning and transition effects to a series of images during playback.^[20] The codec achieves a higher compression ratio and image quality than WMV 9 for still images as files encoded with WMV Image store static images rather than full-motion video.

Since the format relies on the decoder (player) to generate video frames in real-time, playing WMV Image files even at moderate resolutions (e.g. 30 frames per second at 1024 px × 768 px resolution) requires heavy computer processing. The latest version of the format, WMV 9.1 Image, used by Photo Story 3, features additional transformation effects, but is not compatible with the original WMV 9 Image format.^[20]

Hardware support for WMV Image is available from Portable Media Centers, Windows Mobile-powered devices with Windows Media Player 10 Mobile.^[15]

Since no known domestic DVD player supports this format, users of Photo Story 3 wishing to generate material capable of being played in a DVD player will first have to convert to MPEG-2 before burning a DVD (average file sizes in MPEG-2 are 5 to 6 times the .wmv file).

Versions

Public Name	FourCC	Description
Microsoft MPEG-4 version 1	MPG4	Video for Windows-based codec. Non-standard MPEG-4 codec incompatible with the later standardized version of <u>MPEG-4 Part 2</u> .
Microsoft MPEG-4 version 2	MP42	VfW-based codec. Non-compliant with finalized MPEG-4 part 2 standard.
Microsoft MPEG-4 version 3	MP43	VfW-based codec. Non-compliant with finalized MPEG-4 part 2 standard. Eventually locked for encoding only with ASF files (build 3688 and earlier could also encode to AVI). ^[21]
Microsoft ISO MPEG-4 version 1	MP4S	<u>DirectX Media Objects</u> (DMO)-based codec. MPEG-4 <u>Simple Profile</u> compliant.
Microsoft ISO MPEG-4 version 1.1	M4S2	MPEG-4 <u>Advanced Simple Profile</u> compliant. ^[22]
Windows Media Video 7	WMV1	DMO-based codec.
Windows Media Screen 7	MSS1	DMO-based codec. Optimized for low-bitrate sequential screen captures or screencasts. Deprecated in favor of Windows Media 9 Screen codec.
Windows Media Video 8	WMV2	DMO-based codec.
Windows Media Video 9	WMV3	DMO-based codec. Video for Windows (VfW/VCM) version also available. ^[1] (https://web.archive.org/web/20060113033757/http://www.microsoft.com/downloads/details.aspx?FamilyID=0c99c648-5800-4aa3-a2fe-3de948689db8&displaylang=en)
Windows Media Video 9 Screen	MSS2	DMO-based codec. Optimized for low-bitrate sequential screen captures or screencasts.
Windows Media Video 9.1 Image	WMVP	DMO-based codec. Optimized for encoding video from sequential bitmap images. Used, for instance, by Photo Story.
Windows Media Video 9.1 Image V2	WVP2	DMO-based codec. Optimized for encoding video from sequential bitmap images. Used, for instance, by Photo Story.
Windows Media Video 9 Advanced Profile	WMVA	DMO-based codec. Deprecated as non-VC-1-compliant.
Windows Media Video 9 Advanced Profile	WVC1	DMO-based codec. VC-1 compliant format.

Audio compression formats

The audio format used in conjunction with Windows Media Video is typically some version of Windows Media Audio, or in rarer cases, the deprecated Sipro ACELP.net audio format. Microsoft recommends that ASF files containing non-Windows Media formats use the generic .ASF file extension.

Players

Software that can play WMV files includes Windows Media Player, RealPlayer, MPlayer, Media Player Classic, VLC Media Player and K-Multimedia Player. The Microsoft Zune media management software supports the WMV format, but uses a Zune-specific variation of Windows Media DRM which is used by PlaysForSure. Many third-party players exist for various platforms such as Linux that use the FFmpeg implementation of the WMV format.

On the Macintosh platform, Microsoft released a PowerPC version of Windows Media Player for Mac OS X in 2003,^[23] but further development of the software has ceased. Microsoft currently endorses the 3rd party Flip4Mac WMV, a QuickTime Component which allows Macintosh users to play WMV files in any player that uses the QuickTime framework, free of charge to view files but chargeable to convert formats.^[24] The WMV installer is bundled with Microsoft Silverlight by default, installation without Silverlight can be accomplished with a "Custom" install. According to the Flip4Mac website, WMV files with DRM encryption are not compatible with the component.

Encoders

Many programs can export video in WMV format; a few examples are Windows Movie Maker, Windows Media Encoder, Microsoft Expression Encoder, Sorenson Squeeze,^[25] Sony Vegas Pro,^[26] AVS Video Editor, VSDC Free Video Editor, Telestream Episode, Telestream FlipFactory^{[27][28]}, and FFmpeg.

Programs that encode using the WMV Image format include Windows Media Encoder, AVS Video Editor, and Photo Story.

Digital rights management

While none of the WMV formats themselves contain any digital rights management facilities, the ASF container format, in which a WMV stream may be encapsulated, can. Windows Media DRM, which can be used in conjunction with WMV, supports time-limited subscription video services such as those offered by CinemaNow.^[29] Windows Media DRM, a component of PlaysForSure and Windows Media Connect, is supported on many modern portable video devices and streaming media clients such as the Xbox 360.

Criticism

WMV has been the subject of numerous complaints from users and the press. Users dislike the digital rights management system which is sometimes attached to WMV files.^[30] In 2007, the loss of the ability to restore licenses for WMV files in the Windows Media Player 11 was not positively received.^[30]

See also

- JPEG XR/HDHD, an image file format and format developed by Microsoft

References

1. "SMPTE VC-1 Receiving Industrywide Support" (<https://web.archive.org/web/20070809134335/http://www.microsoft.com/presspass/press/2006/apr06/04-24VC1PR.mspix>). *microsoft.com*. Archived from the original (<http://www.microsoft.com/presspass/press/2006/apr06/04-24VC1PR.mspix>) on 9 August 2007. Retrieved 3 May 2018.

2. "Microsoft VC-1 Codec Now a Standard" (http://www.betanews.com/article/Microsoft_VC1_Codec_Now_a_Standard/1144097224). *www.betanews.com*. Archived (https://web.archive.org/web/20090224074620/http://www.betanews.com/article/Microsoft_VC1_Codec_Now_a_Standard/1144097224) from the original on 24 February 2009. Retrieved 3 May 2018.
3. "Blu-ray Disc BD-ROM Specification Adds Microsoft's VC-1 Advanced Video Codec" (<https://web.archive.org/web/20070615115610/http://www.microsoft.com/presspass/press/2004/sep04/09-01BluRayDiscPR.msp>). *microsoft.com*. Archived from the original (<http://www.microsoft.com/presspass/press/2004/sep04/09-01BluRayDiscPR.msp>) on 15 June 2007. Retrieved 3 May 2018.
4. "Microsoft Technology Brings HD DVD to the Mainstream" (<https://web.archive.org/web/20070809152521/http://www.microsoft.com/presspass/press/2007/jan07/01-08HDDVDMomentumPR.msp>). *microsoft.com*. Archived from the original (<http://www.microsoft.com/Presspass/press/2007/jan07/01-08HDDVDMomentumPR.msp>) on 9 August 2007. Retrieved 3 May 2018.
5. "The Difference Between ASF and WMV/WMA Files" (<https://web.archive.org/web/20070819113435/http://support.microsoft.com/kb/284094>). November 17, 2003. Archived from the original (<http://support.microsoft.com/kb/284094>) on 2007-08-19.
6. "Archives | Matroska" (<https://web.archive.org/web/20111011142432/http://matroska.org/news/archives.html>). 2003-06-19. Archived from the original (<http://matroska.org/news/archives.html>) on 2011-10-11. Retrieved 2011-10-12. "As a sidenote, his muxer filter will also allow transmuxing of Microsoft WMV9 video files (ASF/WMV container) fine into matroska files, from Graphedit, and with WMV9 VCM installed on your PC you can even open and edit the files in latest VirtualdubMod"
7. Microsoft Corporation (2003-07-07) Windows Media Video 9 VCM (<http://www.microsoft.com/downloads/details.aspx?FamilyID=0c99c648-5800-4aa3-a2fe-3de948689db8&DisplayLang=en>) Archived (<https://web.archive.org/web/20090810203658/http://www.microsoft.com/downloads/details.aspx?FamilyID=0c99c648-5800-4aa3-a2fe-3de948689db8&displaylang=en>) 2009-08-10 at the Wayback Machine, Retrieved on 2009-08-07
8. "Windows - Official Site for Microsoft Windows 10 Home & Pro OS, laptops, PCs, tablets & more" (<https://web.archive.org/web/20171101052328/http://www.microsoft.com/windows/windowsmedia/forpros/codecs/video.aspx#WindowsMediaVideo9VCM>). *www.microsoft.com*. Archived from the original (<http://www.microsoft.com/windows/windowsmedia/forpros/codecs/video.aspx#WindowsMediaVideo9VCM>) on 1 November 2017. Retrieved 3 May 2018.
9. "News, Features, Reviews, Forums and Resources for the Professional Content Creator - Creative Planet Network" (https://web.archive.org/web/20090222024150/http://digitalcontentproducer.com/mag/video_mpeg_makes_scene/). *Creative Planet Network*. Archived from the original (http://digitalcontentproducer.com/mag/video_mpeg_makes_scene/) on 22 February 2009. Retrieved 3 May 2018.
10. "Windows Media Audio & Video 9 Series" (https://web.archive.org/web/20070928022926/http://download.microsoft.com/download/6/f/c/6fc03c60-5d5b-42c0-bcce-5e184fa56741/2_Audio_Video.ppt). *microsoft.com*. Archived from the original (http://download.microsoft.com/download/6/f/c/6fc03c60-5d5b-42c0-bcce-5e184fa56741/2_Audio_Video.ppt) on 28 September 2007. Retrieved 3 May 2018.
11. "Windows - Official Site for Microsoft Windows 10 Home & Pro OS, laptops, PCs, tablets & more" (https://web.archive.org/web/20100821235549/http://www.microsoft.com/windows/windowsmedia/demos/video_quality_demos.aspx). *www.microsoft.com*. Archived from the original (http://www.microsoft.com/windows/windowsmedia/demos/video_quality_demos.aspx) on 21 August 2010. Retrieved 3 May 2018.
12. Windows Media 9 Series Beta Reviewer's Guide (http://www.elims.org/downloads/sample_content/9Series_RevGuide.pdf) Archived (https://web.archive.org/web/20070928023100/http://www.elims.org/downloads/sample_content/9Series_RevGuide.pdf) 2007-09-28 at the Wayback Machine

13. Using the Advanced Settings of the Windows Media Video 9 Advanced Profile Codec (<http://www.microsoft.com/windows/windowsmedia/howto/articles/codecadvancedsettings.aspx>) Archived (<https://web.archive.org/web/20070811040550/http://www.microsoft.com/windows/windowsmedia/howto/articles/codecadvancedsettings.aspx>) 2007-08-11 at the Wayback Machine
14. Waggoner, Ben; Waggoner, Ben (21 February 2007). "Best Practices for Windows Media Encoding" (<http://www.streamingmedia.com/Articles/ReadArticle.aspx?ArticleID=64909>). *Streaming Media Magazine*. Archived (<https://web.archive.org/web/20110726005854/http://www.streamingmedia.com/Articles/ReadArticle.aspx?ArticleID=64909>) from the original on 26 July 2011. Retrieved 3 May 2018.
15. "Windows - Official Site for Microsoft Windows 10 Home & Pro OS, laptops, PCs, tablets & more" (<https://web.archive.org/web/20070914112132/http://www.microsoft.com/windows/windowsmedia/player/windowsmobile/faq.aspx>). *www.microsoft.com*. Archived from the original (<http://www.microsoft.com/windows/windowsmedia/player/windowsmobile/faq.aspx>) on 14 September 2007. Retrieved 3 May 2018.
16. "MSN - Outlook, Office, Skype, Bing, Breaking News, and Latest Videos" (<https://web.archive.org/web/20051020113823/http://download.microsoft.com/download/0/7/e/07e701c3-2875-46be-9418-9c6591c46eb8/wmvhdencoding.DOC>). *go.microsoft.com*. Archived from the original (<http://go.microsoft.com/fwlink/?LinkId=41932>) on October 20, 2005. Retrieved 3 May 2018.
17. "Microsoft Silverlight Developer Server Audio Video Streaming FAQ" (<https://web.archive.org/web/20070904060106/http://www.microsoft.com/silverlight/faq.aspx>). *microsoft.com*. Archived from the original (<http://www.microsoft.com/silverlight/faq.aspx>) on 4 September 2007. Retrieved 3 May 2018.
18. "Windows - Official Site for Microsoft Windows 10 Home & Pro OS, laptops, PCs, tablets & more" (<https://web.archive.org/web/20171101052328/http://www.microsoft.com/windows/windowsmedia/forpros/codecs/video.aspx#WindowsMediaVideo9Screen>). *www.microsoft.com*. Archived from the original (<http://www.microsoft.com/windows/windowsmedia/forpros/codecs/video.aspx#WindowsMediaVideo9Screen>) on 1 November 2017. Retrieved 3 May 2018.
19. "Microsoft Screen Codec - MultimediaWiki" (http://wiki.multimedia.cx/?title=Microsoft_Screen_Codec). *wiki.multimedia.cx*. Archived (https://web.archive.org/web/20130515053029/http://wiki.multimedia.cx/?title=Microsoft_Screen_Codec) from the original on 15 May 2013. Retrieved 3 May 2018.
20. "Windows - Official Site for Microsoft Windows 10 Home & Pro OS, laptops, PCs, tablets & more" (<https://web.archive.org/web/20171101052328/http://www.microsoft.com/windows/windowsmedia/forpros/codecs/video.aspx#WindowsMediaVideo9ImageVersion2>). *www.microsoft.com*. Archived from the original (<http://www.microsoft.com/windows/windowsmedia/forpros/codecs/video.aspx#WindowsMediaVideo9ImageVersion2>) on 1 November 2017. Retrieved 3 May 2018.
21. VirtualDub VirtualDub documentation: codecs (http://www.virtualdub.org/docs_codecs.html) Archived (https://web.archive.org/web/20110516013426/http://www.virtualdub.org/docs_codecs.html) 2011-05-16 at the Wayback Machine, Retrieved on 2009-11-28
22. MPEG4 Part 2 Video Decoder MSDN documentation: Profiles and Levels (<http://msdn.microsoft.com/en-us/library/dd756559%28VS.85%29.aspx>) Archived ([https://web.archive.org/web/20131203004213/http://msdn.microsoft.com/en-us/library/dd756559\(VS.85\).aspx](https://web.archive.org/web/20131203004213/http://msdn.microsoft.com/en-us/library/dd756559(VS.85).aspx)) 2013-12-03 at the Wayback Machine, Retrieved on 2009-11-28
23. "Office 365 for Mac, Office 2016 for Mac" (https://web.archive.org/web/20180503013327/https://products.office.com/en-US/mac?pid=download&location=%2Fmac%2Fdownload%2Fmisc%2Fwinmp_osx.xml&secid=80&ssid=8&flgnosysreq=True). *office.com*. Archived from the original (https://products.office.com/en-US/mac?pid=download&location=/mac/download/misc/winmp_osx.xml&secid=80&ssid=8&flgnosysreq=True) on 3 May 2018. Retrieved 3 May 2018.
24. "Office 365 for Mac, Office 2016 for Mac" (<https://web.archive.org/web/20180412170040/https://products.office.com/en-US/mac?pid=windowsmedia>). *office.com*. Archived from the original (<https://products.office.com/en-US/mac?pid=windowsmedia>) on 12 April 2018. Retrieved 3 May 2018.

25. "Sorenson Media - Next Generation Television Starts Here" (<https://web.archive.org/web/20180323052423/https://www.sorensonmedia.com/>). *Sorenson Media*. Archived from the original (<http://sorensonmedia.com>) on 23 March 2018. Retrieved 3 May 2018.
26. "Sony Creative Software - Vegas Pro 8 - Technical Specifications" (<https://web.archive.org/web/20080302001832/http://www.sonycreativesoftware.com/products/product.asp?PID=457&PageID=107>). *sonycreativesoftware.com*. Archived from the original (<http://www.sonycreativesoftware.com/products/product.asp?PID=457&PageID=107>) on 2 March 2008. Retrieved 3 May 2018.
27. "Supported file formats in Adobe Premiere Pro 2.0" (<https://web.archive.org/web/20071013122312/http://kb.adobe.com/selfservice/viewContent.do?externalId=332612>). *adobe.com*. Archived from the original (<http://kb.adobe.com/selfservice/viewContent.do?externalId=332612>) on 13 October 2007. Retrieved 3 May 2018.
28. "EMS - PLAYOUT - CG - MAM - INGEST - ENCODER - IP MULTIVIEWER" (<http://www.easymediasuite.com>). *www.easymediasuite.com*. Archived (<https://web.archive.org/web/20170930085002/http://www.easymediasuite.com/>) from the original on 30 September 2017. Retrieved 3 May 2018.
29. "Windows - Official Site for Microsoft Windows 10 Home & Pro OS, laptops, PCs, tablets & more" (<https://web.archive.org/web/20070822181259/http://www.playsforsure.com/ItemDetail.aspx?id=26>). *www.playsforsure.com*. Archived from the original (<http://www.playsforsure.com/ItemDetail.aspx?id=26>) on 22 August 2007. Retrieved 3 May 2018.
30. "Microsoft Media Player shreds your rights" (<https://web.archive.org/web/20070907023902/http://www.theinquirer.net/default.aspx?article=34523>). *theinquirer.net*. Archived from the original (<https://www.theinquirer.net/default.aspx?article=34523>) on 7 September 2007. Retrieved 3 May 2018.

External links

- Description of the algorithm used for Windows Media encryption (<http://www.spinnaker.com/crypt/drm/freeme/Technical>)
 - Demonstration of WMV 9 delivering 720p video at 1.8 mbit/s ABR (<http://on10.net/Blogs/benwagg/elephants-dream-720p--2-mbps/>)
 - Demonstration of WMV 9 delivering 1080p video at 10 mbit/s ABR (<https://web.archive.org/web/20071224194356/http://on10.net/Blogs/benwagg/elephants-dream-sample/Default.aspx>)
 - History of Windows Media Player (<https://web.archive.org/web/20090418134328/http://software-history.org/?p=3>) (archived 2009)
-

Retrieved from "https://en.wikipedia.org/w/index.php?title=Windows_Media_Video&oldid=984969241"

This page was last edited on 23 October 2020, at 05:09 (UTC).

Text is available under the Creative Commons Attribution-ShareAlike License; additional terms may apply. By using this site, you agree to the Terms of Use and Privacy Policy. Wikipedia® is a registered trademark of the Wikimedia Foundation, Inc., a non-profit organization.