Legal and patent issues

pakkaamo

Kurssi

581260 Ohjelmistotuotantoprojekti (6 ov)

Projektiryhmä

Hankala Visa, student
Kesola Ville, student
Korhola Heikki, student
Oikarinen Kalervo, student
Poikelin Sindi, student
Ronimus Toni, student

Asiakas

Michael Przybilski, HIIT

Johtoryhmä

Juha Taina
Jari Suominen

Kotisivu

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Versiohistoria

Versio	Päiväys	Tehdyt muutokset
1.0	2.12.2009	First version

Sisältö

1 Introduction

This documentation contains legal and patent issues. Mp2 encoder is licensed under the MIT license. We do not know all license issues because, we are not lawyers so we are not qualified to answer this. Patent laws vary wildly between jurisdictions, and in many ucountries patents on algorithms are not recognized. Plus the use of patents to prevent the usage of a format or codec on a specific operating system or together with specific other software might violate antitrust laws. So whether you are safe or not depends on where you live and how judges interpret the law in your jurisdiction. If you gonna use for commercial use we strongly suggest that you should contact to MPEG LA.

Mp2 encoder legal status varies by country. Some future codecs may claimed by patent holders. Such claims may be enforceable in countries like the United States which have implemented software patents, but are considered unenforceable or void in countries that have not implemented software patents. Furthermore, many of these codecs are only released under terms that forbid reverse engineering, even for purposes of interoperability. However, these terms of use are forbidden in certain countries. For example, some European Union nations have not implemented software patents and/or have laws expressly allowing reverse engineering for purposes of interoperability. In any case, many Linux distributions do not include Mp2 encoder to avoid legal complications.

2 Patent and legal issues

2.1 MPEG-1 ISO/IEC 11172

MPEG-1 (wp) is a widely used standard for compressing video and audio. The various parts of the standard can be purchased from the ISO or ANSI (Part 1,2,3). It is used for video cds and most DVD players can play these cds. MPEG-1 is a subset of MPEG-2, so any complete MPEG-2 player can play MPEG-1 video and audio as well. Both Microsoft Media Player and Apple Quicktime play MPEG-1. There are three different ways audio can be encoded in MPEG-1. The simplest is layer 1, layer 2 is more complicated and Layer 3 (also know as MP3) is the most complex. A near complete draft of MPEG-1 was created in September 1990 and the final version of the decoding spec (ISO 11172-1,2,3) was published inAugust 1993. The draft standard was publicly available as ISO CD 11172 by December 6, 1991. Berkeley Plateau Multimedia Research Group created a software MPEG-1 video decoder by November of 1992 (Old versions download). Reference encoders and decoders were published in 1998 by the ISO and the source code can be downloaded.

The ISO has a patent database (Use the JCT1 one, and search for 11172) which lists one MPEG-1 patent owned by the Compusonics Corporation, US 4,472,747, which expired in 2003. So, is MPEG-1 be implemented without worrying about infringing patents? Nope. MPEG-1 Layer 3 audio has at least three separate companies that claim to have patents, Alcatel-Lucent, Thompson and AudioMPEG. All their claimed US MP3 patents are listed in the MP3 patent appendix below. The last of these patents expires in March of 2020. If you only look at the MP3 patents filed before December 1992 (one year after the decoding spec was published), then the last decoding patent expires in December of 2012. AudioMPEG claims that their patents cover MPEG-1 layers 1,2 and 3. The other companies just talk about Layer 3. So, at the minimum, fully decoding and encoding MPEG-1 audio is patented. The US 4,972,484 patent "Method of transmitting or storing masked sub-band coded audio signals"seems to expire July 21 this year. That patent describes the basic algorithm used for Layer 2 audio. While there may be other Layer 2 patents, the expiration of 4,972,484 could make Layer 2 audio patent free in the US. It is quite possible that some of the claimed MP3 patents are could either be invalided by prior art, or could be avoided by using a different method of implementation.

So, assuming MPEG-1 with Layer 2 audio is patent free, but MP3 is not, what would that allow without patent issues? It would not allow fully conforming MPEG-1 decoders because they require MPEG-1 Layer 3 audio which is probably patented till at least December of 2012. In other words, the MPEG-1 decoder would not have sound if it found MP3 data. MPEG-1 encoders would be possible, since they could just encode the audio with the Layer 2 method. Video CDs use Layer 2 audio, so both encoding and decoding could be done for them. If it was done carefully, encoding for DVD could be done since MPEG-2 is fully backward compatible with MPEG-1.

3 Encoder development and legal threats

AAC may also have received an unexpected boost from a US patent case brought by Alcatel-Lucent, which led to Microsoft being fined $1.52bn (£770m) in February. Microsoft argued that it had already licensed MP3 from the Fraunhofer Institute in Germany, like everybody else. If the judgement stands, thousands of companies could be at risk of fines. AAC is also heavily patent protected and companies must pay high fees to license the patents. However, there's a "patent pool"and a safe one-stop shop at Vialicensing).Under normal circumstances, it's very hard to dislodge a common file format. Most music stores would probably have continued to use MP3 if the music labels had not insisted on copy protection. MP3 doesn't include DRM, so suppliers switched to AAC, WMA and other formats that they could protect to some extent. This started MP3's decline.

3.1 MP3

Old file format that generally works badly at bit rates below 128kbps but can sound good at 160-196kbps. At higher bit rates with VBR (variable bit rate) encoding, the audio quality should be equivalent to CD, for most people. Drawback: large file sizes. Many organizations have claimed ownership of patents related to MP3 decoding or encoding. These claims have led to a number of legal threats and actions from a variety of sources, resulting in uncertainty about which patents must be licensed in order to create MP3 products without committing patent infringement in countries that allow software patents.

The various MP3-related patents expire on dates ranging from 2007 to 2017 in the U.S. The initial near-complete MPEG-1 standard (parts 1, 2 and 3) was publicly available in December 6, 1991 as ISO CD 11172. In the United States, patents cannot claim inventions that were already publicly disclosed by the inventor more than a year prior to the filing date, but for patents filed prior to June 8, 1995, submarine patents made it possible to extend the effective lifetime of a patent through application extensions. Patents filed for anything disclosed in ISO CD 11172 more than a year after its publication are questionable; if only the known MP3 patents filed by December 1992 are considered MP3 decoding may be patent free in the US by December of 2012.

Thomson Consumer Electronics claims to control MP3 licensing of the Layer 3 patents in many countries, including the United States, Japan, Canada and EU countries. Thomson has been actively enforcing these patents.

MP3 license revenues generated about ¿100 million for the Fraunhofer Society in 2005.

In September 1998, the Fraunhofer Institute sent a letter to several developers of MP3 software stating that a license was required to "distribute and/or sell decoders and/or encoders". The letter claimed that unlicensed products "infringe the patent rights of Fraunhofer and Thomson. To make, sell and/or distribute products using the standard and thus our patents, you need to obtain a license under these patents from us."

However, there exist both free and/or proprietary alternatives, with free formats such as

Vorbis, AAC, and others. Microsoft's usage of its own proprietary Windows Media format allows it to avoid licensing issues associated with these patents by avoiding usage of the MP3 format entirely. Until the key patents expire, unlicensed encoders and players could be infringing in countries where the patents are valid.

3.2   AAC

AAC (Advanced Audio Coding) is an audio compression scheme first standardized within MPEG in 1997. AAC was designed to provide high quality audio at lower bit-rates than previous MPEG audio compression formats. AAC was further refined through the MPEG-4 standardization process and has subsequently been enhanced with bandwidth extension technology yielding High Efficiency AAC (HE AAC), and with the addition of parametric stereo, resulting in High Efficiency AAC version 2 (HE AAC v2).

The "AAC Family"is set of backwards-compatible audio coding technologies: MPEG-4 AAC LC decoders can playback MPEG-2 AAC LC bit-streams, MPEG-4 HE AAC decoders can playback both MPEG-4 and MPEG-2 AAC LC bit-streams, etc. In this way the AAC family can support a wide variety of applications ranging from extremely low bit-rates required for music delivery over cellular phone networks, to ¿transparent¿ quality (indistinguishable from the original source material) for the most discriminating listeners.

A copy of the MPEG-4 Audio standard, which incorporates the AAC formats, can be purchased from the ISO online store (search for ¿14496-3¿).

Multichannel replacement for MP3 that works well at bit rates of 96kbps and below, and produces smaller files. At 128kbps can be not far short of CD quality, and at 160kbps or higher, it should be equivalent to CD for most people. Drawbacks: complex, heavily patented and has many varieties.

3.3   MPEG-2 AAC

A powerful audio coding system capable of superior results at stereo bit rates below 128 kb/s.

Advanced Audio Coding, or AAC, is one of several audio coding systems specified in the MPEG-2 standard (ISO/IEC 13818-7). Dolby Laboratories first began administering the MPEG-2 AAC patent licensing program in 1998, and today Via Licensing offers a joint license for the MPEG-2 AAC patents of AT&T, Dolby, Fraunhofer IIS, Philips, and Sony.

MPEG-2 AAC is the audio format utilized in the Japanese Digital Broadcast system, known as ISDB (Integrated Services Digital Broadcasting). MPEG-2 AAC is also the basis of the audio coding technology used by XM Radio, one of two satellite radio services currently operating in the United States.

MPEG-2 AAC has been extended with additional features and capabilities in MPEG-4

AAC . However, companies creating products for the applications described above may not require these additional AAC tools, and for such applications, we offer the MPEG-2 AAC Patent License Agreement.

A copy of the MPEG-2 AAC standard can be purchased from the ISO online store (search for "13818-7").

4   References

http://www.kuro5hin.org/story/2008/7/18/232618/312
http://ffmpeg.org/legal.html
http://wiki.audacityteam.org/index.php?title=FFmpeg
http://www.guardian.co.uk/technology/2007/apr/12/newmedia.guardianweeklytechnologysection1
http://en.wikipedia.org/wiki/MP3
http://www.vialicensing.com/Licensing/AAC_index.cfm
http://www.vialicensing.com/Licensing/MPEG2AAC_index.cfm