

Audio Technologies on the Internet

Significance

The availability of audio on the Web is increasing at a staggering rate. Several companies continue to compete as the reigning power in audio on the Web. At this point, many would argue of the popularity of MP3, though some other competitive products have been emerging recently. There is much controversy and concern regarding the intellectual property of the recording artists and the illegal pirating of this property through the use of this technology. Many companies are attempting to solve these problems by ensuring that all audio files are purchased online, if necessary. This report will focus upon the availability of audio files on the Web, either in the form of streaming audio or downloadable audio. The six technologies discussed are RealAudio, Quicktime, MS Audio, MP3, a2b, and Liquid Audio.

Discussion

The following is a brief overview of the six technologies listed above.

RealAudio

RealAudio is developed by Progressive Networks. It is a client program. In other words, the RealAudio client receives the audio information from a RealAudio server, enabling a person to hear the audio while on the Web. RealAudio is delivered as streaming sound so that one can hear the beginning segment of an audio clip as the remainder of the audio file is downloading. RealAudio capabilities are built into more recent browsers, but if necessary the RealAudio plug-in may be downloaded at a variety of Web sites. Currently, one of the latest innovations at Progressive Networks is the RealJukebox. It has a small graphic interface that resembles a tape or CD player and includes a graphic equalizer, so that a listener can adjust according to his/her taste. Also, it records MP3s at a rapid 320 kbps. RealJukebox supports the MP3, A2B, Liquid Audio, and IBM's EMMS formats. In addition, the user can convert audio to other formats. It is a useful tool for organizing MP3 files on one's hard drive. (Real.com, 2000)

Quicktime

Quicktime is a multimedia playing and storage technology designed by Apple Computers. Like RealAudio, the Quicktime audio player may be downloaded, though it is built in to the latest Web browsers. Quicktime also supports streaming audio. The latest free version of the player is Quicktime 4.1, a streaming audio and video player. Because Quicktime was originally designed for Macs, the player interface is quite interesting, as it combines typical interface design features of both Mac and Windows platforms. (Schultz, 2000) However, the interface appears to be simple and intuitive for the user. For those who want more advanced features, Quicktime Pro 4.1 is also available for about \$29.99. Quicktime Pro 4.1, enables one to create Internet-ready audio and video. Over thirty audio formats are supported, including MP3. (Apple Computers, 2000).

MS Audio

Microsoft Audio aspires to deliver an advanced technology of storing and distributing high-quality audio. The goal is to "unseat the MP3 format." (Guglielmo, 1999) Like Quicktime, MS Audio is a streaming audio player. In addition to this, Microsoft is addressing the music industry's concerns about piracy by including a rights management system that requires consumers to obtain a digital key before listening to a music file. In this way music can be sold over the Web, because the digital key tracks the amount and types of music being downloaded. (Guglielmo, 1999)

MP3

MP3 is one of the most popular audio file formats available on the Internet. An MP3 file can be compressed to as little as one-twelfth of the original file size. In order to hear an MP3, you must have an MP3 player built into your computer's operating system. However, Windows 98 or later versions already have the player installed. Some of the most common MP3 players available for downloading are Winamp for PCs, MacAmp, and mpeg123 for Unix, although there are many popular players emerging frequently. MP3s are most commonly downloaded *before* they can be played, though streaming MP3 is possible. Currently, portable MP3 players on the market are becoming popular, such as the Diamond Rio PMP 300. This type of portable player has 32 MB of re-recordable flash RAM and can store up to one hour of music. It requires a single AA battery. In

order to download MP3s to the portable player, one can use a parallel port cable to connect the player to a PC. Diamond Rio's transfer software is also necessary. Music may also be transferred to the player from a CD. (Leemon, 1999)

Liquid Audio

This company has formed another effort to deliver music over the Internet, while protecting the copyright of recording artists. The products developed by Liquid Audio are supported in many different formats such as MP3. In order to access music through Liquid Audio, an individual must download the Liquid Audio player, available at <http://www.liquidaudio.com/>. The player has a security system known as FastTrack security, for users who wish to download music on only one computer. Once a user opens a Liquid track, the Genuine Music icon (www.genuinemusic.com) is displayed to verify the authenticity of the track. This protects the intellectual property of recording artists. Liquid Audio music files can be downloaded and played or can be accessed as streaming files. The Liquid Audio player has support for the latest CD burners from Creative Labs, HP, Philips and Yamaha, and others. The interface organizes the user's music tracks, including MP3 tracks. For streaming audio, the user must also have RealNetworks' RealPlayer G2 installed, which is currently only available for Windows.

a2b

This Web site uses a music player developed by AT&T. The player is similar to the MP3, because it uses a compression algorithm to decrease file size while maintaining quality audio. The AT&T Proprietary Compression Algorithms can compress an audio file to ratios as high as 20:1, allowing for quicker downloads. Some music is free of charge for downloads, while other selected music must be paid for online, using a public key cryptography to limit the audio track to paying customers. The CryptoLib Security Library is a technology for ensuring that tracks are transmitted securely, and tracks are played only by the individual(s) with the matching encryption key. The PolicyMaker technology controls aspects of copy privileges and allows varying options for audio distribution such as song rental, purchase, and resale. (a2b music, 1998)

Currently, a2b it is available only for PCs, though plans for Mac compatibility are underway. In order to hear music through a2b, the user must download the player available at the a2b Web site. For streaming audio, the user must also have Real G2 player installed, from RealNetworks.

Comparisons

According to a recent article, Real Audio's RealJukebox is stirring up some concern for MP3. This is due to the fact that RealJukebox offers more tools for organizing and managing MP3 files than most MP3 players. RealJukebox offers more advanced means of actually keeping track of the many audio files on one's hard drive. In addition to this, it supports many other audio file formats, as stated previously.

(Shimmin, 1999)

PC Magazine recently evaluated and compared the sound quality produced by the six technologies discussed above. The results varied according to modem speed (28 or 56 Kbps) and the type of music played. For example, in the category measuring the sound quality of rock music (at a connection speed of 56 Kbps), the Quicktime player scored the highest ("excellent"), while LiquidAudio, MS Audio, and Real Audio were labeled as merely "good". MP3 scored "fair", and a2b scored "poor". However, at the speed of 28 Kbps, Quicktime scored only "good", while all the other technologies scored "fair", except for a2b, which again scored "poor". In the category for sound quality of voice recordings, RealAudio, MS Audio, and MP3 had the best sound quality, though there was some variation depending upon the voice being male or female. In the categories of classical and electronic music, all of the streaming technologies (MS Audio, Real Audio, and Quicktime) generally had the best sound quality, though this varied according to the modem speed. Liquid Audio also performed adequately in the categories of classical and electronic, but MP3 and a2b did not receive favorable rankings in these categories.

(Unknown, PC Magazine, 1999) Therefore, the type of technology chosen depends upon the type of sound a user wants. Undoubtedly, these six technologies will continue to improve at a rapid rate. Though it is difficult to determine which technology will be the most powerful in five years, one can use the current findings and reviews listed above as a guide.

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Related Links on the Web

a2b music

www.a2bmusic.com

Audio File Formats

<http://home.sprynet.com/~cbagwell/AudioFormats-11.html>

Audio on the Internet

<http://www.nyu.edu/atg/library/papers/internet.audio/>

Internet Audio Primer

<http://www.edisonshop.com/primer.htm>

Liquid Audio

www.liquidaudio.com

MIDI

www.midi.com

MIDI VS. MP3

<http://mp3.about.com/entertainment/mp3/library/weekly/aa051898.htm?rnk=r1&terms=high+audio+format+should+i+use%3F>

MP3

www.mp3.com

MS Audio

<http://www.microsoft.com/Windows/windowsmedia/en/compare/SuperiorAudio.asp>

Quicktime

www.apple.com/quicktime

RealAudio

www.real.com

Webmonkey Multimedia- Audio/MP3

http://hotwired.lycos.com/webmonkey/multimedia/audio_mp3/index.html

World Wide Web Virtual Library- Audio

<http://archive.comlab.ox.ac.uk/audio.html>

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