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The MP3 revolution

While the Internet is changing the whole world, the combination of the MP3 format with the Internet is enabling powerful online distribution of music—revolutionizing the music world. Online music distribution offers advantages to both

artist and consumer. As an artist, you can directly reach your fans over the Internet without paying the hefty price that music distribution companies take. As a consumer, you can buy precisely the songs that you want to listen to instead of an entire US \$16.99 CD. In addition, you can quickly locate the song that you want to hear, by using PlayList software to organize your online music, rather than look for your CD in all the places that you could have left it. Finally, you can listen to that song anywhere that there's a good network connection without having to bring your audio CD with you. With these incentives, the music world is currently embroiled in fighting legal and technical battles to make online music distribution a reality.

MP3

It all began with the new MP3 format. MP3 stands for "MPEG 1, Audio Layer 3" and is the audio part of the video compression standard defined by the Moving Pictures Experts Group. MP3 can encode data at a wide range of bit rates. In particular, for music, it achieves near-CD quality at 128 Kbps, or about 1 Mbyte per minute, and most MP3s you'll find will be encoded at this rate. The favorable trade-off of an insignificant loss in quality for a large degree of compression, not to speak of the growing capacity and decreasing prices of hard drives, enables

online storage of CD-quality music. You can find more information about the MP3 standard at www.mpeg.org.

Adding to its popularity, MP3 is an open standard, allowing the development of free-ware, shareware, and commercial software. Using a PC with a CD-ROM reader and a standard "CD Ripper" program, you can quickly and easily make your own MP3s from CDs. In addition, you can legally download MP3s from several sites, including www.goodnoise.com and www.mp3.com, for free or for a fee.

There are several options for playing MP3s. FreeAmp (www.freeamp.com) is

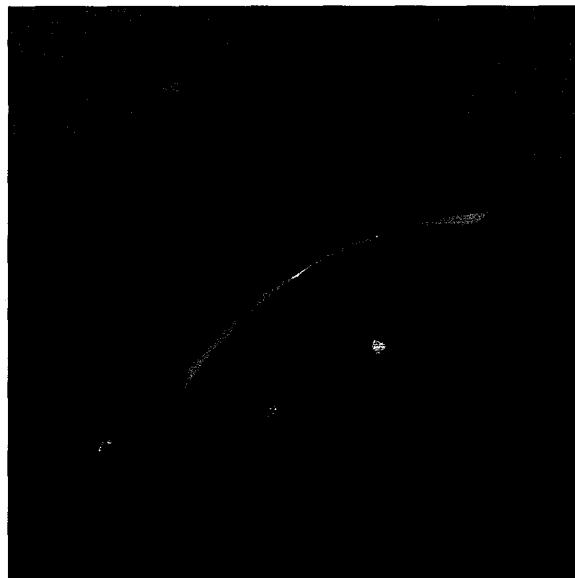
an open-source effort to build a free audio player. WinAmp (www.winamp.com) is a popular shareware player. Also, at least two companies are marketing solid-state MP3 portable players with the intention of making the MP3 format into a consumer standard. Diamond Multimedia (www.diamondmm.com) offers the Rio, and Creative Labs (www.creative.com) offers the Nomad. These players each hold about an hour of MP3 songs and come with extensive utilities to let you make MP3s from your CDs. You can find more information about MP3 players, encoders, utilities, and FAQs at www.mp3.com.

Real networks

In parallel with the MP3 effort, Real Networks has developed its own compression format, called the RealAudio format, that can also encode data at a wide range of bit rates. Real Networks also has

its own player, called the Real-Player G2, that can play both audio and video. Typically, you download an entire MP3, store it on your computer, and then play it as many times as you want. RealAudio, however, is a streaming media that you download in real time, play on Real-Player, but do not store on your computer.

Real Networks faces some disadvantages. To download in real time, your network connection's bandwidth limits the bit rate and, therefore, the quality. In contrast, MP3s separate the downloading from the playing, so you can choose to download at a higher quality. Toward supporting MP3s, Real Networks recently acquired privately held Xing Technology Corporation, a developer of MP3 software.



However, Real Networks offers many advantages. Because you cannot store the data on your computer, online stores that sell music CDs can safely use Real Networks to offer previews, or short clips of music, to foster their sales.

Real Networks has also developed a real-time protocol for managing the streaming of media from a server to many possible clients, operating at potentially different bit rates. The protocol lets them provide live radio broadcast of arbitrarily long audio streams to many simultaneous clients. Broadcast.com (www.broadcast.com) is acquiring the rights to broadcast media over the Internet. For example, they broadcast audio-only live coverage of the entire "March Madness" NCAA basketball tournament and the Rush Limbaugh show, weekdays from 11 am to 2 pm Central Time. Many local radio stations, many of which are listed at www.broadcast.com, also broadcast live over the Internet.

Currently, the Real Player G2 is free, while the fully featured Real Player G2 Plus costs \$29.95. These clients can run as a stand-alone program or as a plug-in to popular Web browsers. Real Networks makes most of its money on its servers that distribute audio and video. With over 57 million registered users of its clients, Real Networks is the undisputed leader in media delivery over the Internet.

Legal issues

Unfortunately, although MP3s help artists and consumers, they also facilitate the piracy of copyrighted music. For example, you can create an MP3 from a CD or download one from the Internet, and then send it to someone else or make it freely available at a Web site. If you go to any search engine and type "mp3", you will find a tremendous number of links. In fact, Lycos operates a specialized search engine for MP3 songs at mp3.lycos.com. In addition, real-time channels, such as the Internet Relay Chat system, offer a forum for the real-time exchange of MP3 music. If you log on to IRC at any time, you will likely find several dozen ongoing chats dedicated to trading MP3s.

Among many others, the Recording Industry Association of America (RIAA), www.riaa.com, is fighting the rapid proliferation of MP3 music. They sued to prevent the release of Diamond's Rio MP3 portable player late last year, but they lost. They routinely threaten to sue, which ef-

fectively shuts down Web sites that are distributing illegal MP3s. As a result of these shutdowns, and also because of the inherently high turnover rate for MP3s, you'll find that most MP3 links on the Web are broken. However, the Web sites can easily be put up again. In addition, the real-time channels are difficult to monitor and remain highly effective.

Realizing that they are fighting a losing battle, the RIAA is seeking ways to join the revolution. They have created a working group, called the Secure Digital Music Initiative (SDMI), to explore technological alternatives to the MP3 format. The group will try to protect online music from illegal duplication and mass distribution, and encourage the creation of interoperable standards.

UNFORTUNATELY, ALTHOUGH MP3S HELP ARTISTS AND CONSUMERS, THEY ALSO FACILITATE THE PIRACY OF COPYRIGHTED MUSIC.

AT&T has proposed a proprietary solution, called the a2b standard. a2b encodes CD-quality music at roughly the same 1-Mbyte-per-minute compression, but uses strong cryptography to personalize an a2b song to a particular player. If you download an a2b song, only your player on your computer will be able to play it. In addition, a flexible PolicyMaker lets a distributor limit playability. For example, an a2b song can be designed to expire after one play or after 30 days. Many artists, including Alanis Morissette and Counting Crows, have shown their support by releasing singles in the a2b format. However, although a2b is technically sound, its progress is limited by its inherently closed, proprietary model. To my knowledge, a2b music can only be found at www.a2bmusic.com, a subsidiary of AT&T.

In contrast, IBM has proposed an open solution, called the Electronic Music Management System, which can manage and distribute multiple types of media over multiple networks. EMMS is an open

architecture that is widely supported by music distribution companies, including BMG, Sony Music, Universal Music, and Warner Music. Also, IBM recently partnered with Real Networks to integrate EMMS into RealPlayer. Furthermore, EMMS is consistent with and compatible with SDMI's goals. IBM will soon begin a six-month trial of EMMS by making over 1,200 full-length, CD-quality albums available to cable-modem users in San Diego.

Finally, Microsoft has proposed a comprehensive framework, called Microsoft Media Technology 4.0, which offers compression, distribution, and protection of both audio and video. Microsoft claims MP3 quality at half the size, and their framework, like RealPlayer, also handles video. In addition, they have partnered with Reciprocal Inc. to offer real-time transaction management, including micropayments to foster a "pay-per-listen" model.

I'm looking forward to what this revolution in the music world will bring. Perhaps the pay-per-listen model will catch on. This model could be more appealing to music-distribution companies, because customers will not store the music on their computers, so pirating music will be more difficult. Because I tend to listen to a song many times, and then never listen to it again, I think I could also like this model.

Or, perhaps, I will want to buy digital licenses for the songs that I want to hear, and a central, networked database will organize all my licenses. Whenever and wherever I wish to hear a song—whether it be at home, at work, in my car, on the plane, or on vacation—any nearby server attached to the network will be able to provide the service. First, it will query my database to ensure that I have the proper license to play the song, and then it will deliver the bits to my ears. Of course, I'm also assuming that there will be a ubiquitous, high-performance network, with many storage devices and servers attached! Either way, you can be sure that I will not be buying any more cumbersome physical objects to hold my music! ■