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Music And The Internet: Digital Audio Workshop

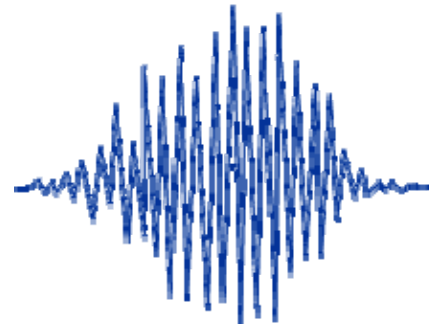
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Dino Covelli provided invaluable assistance in writing this section

Audio is certainly one of the most important sections of content that can live on your site. It can also be one of the most difficult and perplexing sections to develop. What types of audio files should you use? Should you offer downloads, and if so, should they be secured or unsecured? And how does one actually go about getting all that music into the computer?

THE HISTORY OF DIGITAL AUDIO

First let me say that when talking about music and the web, tons of technical jargon comes into play and can easily become distracting. Remember to use [Webopedia](#) to define terms you don't readily understand. Still, I'm going to try to sum up a majority of the different files and formats by using only one "technical" term. Since a majority of Internet users are using modem connections, their bandwidth gets filled very quickly when downloading large files. This leads to the need for file compression. Files can be compressed at the sending side, and then decompressed at the receiving side utilizing a *codec*. Codec stands for compressor/decompressor, or alternately coder/decoder.



When it comes to digital audio, there are many, many choices for file types and codecs. The different operating systems prefer their own file types. Windows uses **WAV** files, which are uncompressed and very large. Most Macs use similar formats known as **AIFF** files. These are the types of files typically used for writing to CDs. Before a decent compression device was introduced, people generally let their audio files take a massive cut in sound quality in order to get the files from the server to the user. CD-quality audio was reduced to telephone quality in order to be reduced enough for a reasonable download.

Then Sun Microsystems introduced the **AU** format, which applied slight compression with less noticeable sound quality loss. In general, downloadable music still sounded awful, but AU marked the beginning of the high-end codec. It wasn't until high-end codecs were developed that digital music actually became something people were interested in listening to. Nowadays, codecs are so powerful, you can download an entire album-worth of CD quality sound in just 10 minutes – and there you have it. The digital download revolution. The following are some of today's most popular Internet audio file formats, with basic descriptions and advantages/disadvantages. Click on the related links to download product or for additional information.



QuickTime Apple introduced QuickTime in the early 90's, around the time they introduced the first color Mac's; it remains an integrated part of the Mac Operating System. Therefore, QuickTime is mainly popular with Mac users. QuickTime originated as the very first video codec offered on a personal computer, and it is still popular as a video format. But Apple hasn't won over many hearts with their audio codecs. The QuickTime audio files are **MOV** files, and they don't apply much compression. The sound quality suffers greatly in this case. The latest version of QuickTime does integrate MP3 compression (one of the best quality codecs offered today), but still QuickTime has not caught on as a popular format. This may be because over 80% of Internet users are PC users who generally think of QuickTime as a Mac application.



RealAudio

RealNetworks had been around for years before gaining popularity. The concept behind RealAudio is "streaming," which means listening to music as it loads. As RealNetworks improved their codec over the years, the sound quality also improved. The best feature of Real's streaming capabilities is their ability to perform "bandwidth negotiation." Depending on a user's bandwidth, a higher or lower quality version of the same **RAM** sound file is streamed. This is negotiated by the server and the user's player. If there is net congestion the software will switch to a lower-quality version until the congestion clears, at which point it will switch back, almost unnoticed by the user. The RealAudio format is very popular for offering sound clips, because the user only waits a few seconds before hearing the clip that they requested. This format is not generally used for high quality downloads. One major drawback to RealAudio is that the server-side software, required for bandwidth negotiation, is not user-friendly. It takes a great deal of patience to set-up the software, specifically the G2 server, but it's certainly worthwhile, since it is such a popular application.

Windows Media

Windows Media, like RealAudio, has streaming capabilities, and their codec offers, arguably, the best sounding quality for streaming. However with this format, a user's computer is almost completely dedicated to decoding the **ASF** (audio and video) and/or **WMA** (audio only) files. Even the fastest Pentium processor gets bogged down when streaming Windows Media files. This causes the computer to respond slowly and can also lead to crashes. You won't find too many people with less than a Pentium II who refer to Windows Media as a useable file format. The other downside to Windows Media is that the format is rendered useless to Mac users. Microsoft offers only a beta version of the Mac Media Player, and it tends to crash often. Nor does it seem that Microsoft has any plans to release an official version of the Media Player for the Mac at any time in the future. Windows Media is the only audio format that uses a codec which is Operating System biased.



MPEG-2 Layer III (MP3)

The Moving Picture Experts Group invented a codec that just about every computer user keeps close to their hearts these days. The MP3 was introduced as a way to take CD-quality files and apply severe compression to them in order to squash them down by around 90% without almost any quality loss. With a fast enough processor, your computer does all the hard work of decoding these sophisticated sound files while you enjoy an almost unnoticeable change from the original CD version. A 5MB MP3 file sounds almost exactly the same as its 50MB parent file. There are only a couple drawbacks to the MP3 Codec. Many software companies offer MP3 Encoders (compressors) using their own compression algorithms. Because of this, there are many MP3 Encoders on the market that do a poor job of encoding high-end (treble). This is called *artifacting*, and it results in the user being able to hear "residue" left over from the compression. High-hats, cymbals, guitars and even vocals suffer when *artifacting* results from poor compression algorithms. Another drawback to MP3s is the lower-quality versions of the files that are used for streaming. They do not generally sound as good as the other streaming formats-- there is noticeable *artifacting* and the high-end suffers greatly. A final potential drawback-- or advantage, depending on how you view it-- is that since MP3 files are unsecured, they can be stored on a hard drive, meaning that once a user has downloaded your MP3 he/she can listen to it in perpetuity without ever logging back on to your site. The user can trade your song using file-sharing services such as Napster or Scour.com, or he/she could even burn it onto a CD. I don't personally think that these are bad things for a developing artist, but if you disagree, you may choose to employ a secure-download service such as Liquid Audio. Either way, MP3 is the standard for full-length, high quality downloads.

Liquid Audio

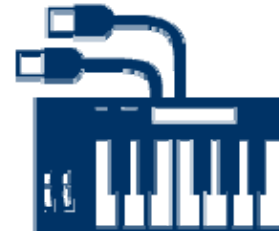
Liquid Audio is not actually an audio format-- it's a "format-neutral distributor." Liquid Audio's main draw is their "secure distribution software" that supports the MP3 format, but which features encryption allowing you to require your users to pay a fee before being able to play the music. These files can additionally be programmed to "time out," or discontinue working after a specified period of time. Liquid Audio offers artists a commerce package, which allows you to sell your downloads through your own site or through Liquid Audio's online retail partners. For \$99 you get the *Liquifier*-- an "audio publishing tool that allows you to format your music for the Internet, provide high quality streaming previews, CD-quality downloadable files, display album art, liner notes and hypertext links." The *Liquifier* works with both Mac and Windows. You also get a one year, five song

hosting account as well as distribution through the Liquid Music Network All in all it's a petty good deal-- only problem is, users don't want to pay for downloads! By utilizing Liquid Audio you may severely cut the number of people willing to download your music. I believe that as a developing artist, you should want people to listen to your music as much as possible, whether they've paid for it or not.

HOW DO YOU MAKE MUSIC INTO DIGITAL MUSIC?

It's really pretty simple. The easiest method, and the one you'll probably be using, is to import music from a CD, which is called "Ripping." To do this you need to get yourself a ripping tool software program, such as [Xing AudioCatalyst](#) for the PC (my favorite-- it creates the best sound), [SoundJam MP](#) for Mac (an MP3 player and encoder in one), [AudioGrabber](#) for PC, or [N2MP3](#) for Mac. These programs cost between \$20 and \$40-- AudioGrabber even offers a free version. These programs will take the music on your CD, which is in CDDA (Compact Disc Digital Audio) format, and convert it into the raw file format appropriate for your operating system, either WAV or AIFF.

You can also input music from other sound sources (cassette, VHS, MiniDisc, etc.) using a soundcard. All Macs come with soundcards. Not all PCs come with them, but you can install one yourself somewhat easily. [SoundBlaster](#) is a very popular PC soundcard, and their basic model will cost you about \$100. The soundcard has an input, and you simply run a connection between your sound source and the soundcard. The soundcard will then convert the music into your raw digital format.



Once you've got your music converted into a raw file format, you can then convert the raw file format into QuickTime, RealAudio, Windows Media or MP3 using the respective software. For QuickTime, you can purchase their Pro Player for \$30, which will allow you to create, edit, save and export QuickTime audio files (as well as movies and images). For RealAudio, you need to use [RealProducer](#), which you can get for free at RealAudio's site (follow the direct link I just gave, as RealNetworks hides it on their site because they want you to buy RealProducer Plus for \$150 instead; if the link is dead spend time on the site hunting for the free version-- it's there). For Windows Media you need the Windows Media Encoder-- a component of the [Windows Media Tools](#) package that is available for free download. For MP3, all of the ripping tool software programs I mentioned above (Xing AudioCatalyst, SoundJam MP, AudioGrabber and N2MP3) have the capability to convert your raw files into MP3s-- no extra software needed. Once you have your audio files converted into the format you desire, you simply upload the file to your server. That's it!



WHICH TYPES OF AUDIO FILES SHOULD YOU USE ON YOUR SITE?

Ideally, you want to provide the user with as many ways to listen to your music as possible, without overloading your allotted disc space. If you are not opposed to offering downloadable music that the end-user can keep and share with others, you will want to present your user with *both* mid-quality streaming clips as well as full-length, high-quality downloads. And given that you are probably working with controlled disc space, you should limit yourself to the two major file formats that work for both Mac and PC users: RealAudio (for streaming) and MP3 (for downloads). If you want to use secured downloads then go with RealAudio (for streaming) and Liquid Audio (for secure downloads). And if you are against downloads entirely, then offering both RealAudio and Windows Media streaming clips would probably be your best bet. By offering these two formats you cover Mac and PC users, as well as both high-end and low-end users.

Remember, you don't want to overload your site, so only use what you have the space to store. You may not have the space to provide files for all of your songs, so consider a rotating selection of files, to keep users coming back for more. No matter what file formats you choose, always provide links for your users to download the necessary players. Be sure to incorporate your audio clips throughout the site. If you mention a certain song in your bio, link it through to the audio clip. If you've got an MP3 of a song that was recorded live at a gig, put a link to it in the tourdates section. Finally, do your own research and explore the options. [Mad Machinery](#) and [The Rosenbergs](#) both have



Real Audio and MP3 selections on their sites, whereas [The Peacemakers](#) utilize just Liquid Audio, and [Spinning Images](#) utilize just MP3. Check them all out before you decide which types of files you'd like to utilize.