

to use on popular MP3 players or in CD-ROM music collections. The reason this MP3 digital audio file format is popular is because it has a relatively good **compression-to-quality ratio**, and because the codec needed to play MP3 audio files is found everywhere, including Android, iOS, Blackberry, Windows, Java, JavaFX, and HTML5.

MP3 is an acceptable format to use in your web site or application as long as you can get the highest quality level possible out of it by using the optimal encoding work process (again, this will be covered in Chapter 12).

Because of software patents, Audacity 2 can't include MP3 encoding software or distribute any MP3 software from its own web site, which is why I showed you how to download and install the free LAME and FFMPEG encoders for Audacity.

It's important to note that the MP3 codec outputs a **lossy** compression audio file format. Lossy compression is where some of the audio data, and thus quality, is discarded during a data compression process; it cannot be recovered. This is similar to the JPEG compression algorithm for digital images, which can cause visual artifacts (purple, green, or yellow pixel smudges).

Open platforms do support the open source **lossless** audio codec called FLAC, which stands for **Free Lossless Audio Codec**. Support for FLAC is now as widespread as MP3, due to the free nature of the software decoder.

FLAC: The 24-Bit HD Audio Capable Free Lossless Audio Codec

FLAC uses a fast algorithm, so the decoder is highly optimized for speed. FLAC supports 24-bit audio, and there are no patent concerns for using it. It is a great audio codec to use in Android or HTML5 if you need high-quality audio with a reasonable data footprint (file size). FLAC supports a range of sample resolutions, from 4-bit data per sample, up to 32-bit data sampling. It also supports a wide range of sample frequencies, from 1 Hz to 65,535 Hz (or 65 kHz), using 1 Hz increments; it is extremely flexible. From an audio playback hardware standpoint, I suggest using a 16-bit sample resolution and either a 44.1 kHz or a 48 kHz sample frequency, unless you're targeting HD audio, in which case you should use 24-bit with 48 kHz for HD audio.

FLAC is supported in Android 3.1 and Java. Therefore, if your end users are using current Android devices, you should be able to safely utilize the FLAC codec. It is possible to use completely lossless new media assets in Android application development by using PNG8, PNG24, PNG32, and FLAC, as long as your application is targeting Android 3.1 or later hardware devices. Next, let's take a look at another impressive open source codec.

Ogg Vorbis: A Lossy High-Performance Open Source Codec

Another open source digital audio codec supported by Android is the **Ogg Vorbis** format. This lossy audio codec is brought to you by the Xiph.Org Foundation. The Vorbis codec data is usually held inside an **OGG** audio data file extension, and thus, Vorbis is commonly called the Ogg Vorbis digital audio data format.

Ogg Vorbis supports sampling rates from 8 kHz to 192 kHz, and supports 255 discrete channels of digital audio. As you now know, this represents 8-bits worth of audio channels. Ogg Vorbis is supported across all Android versions or API-level releases.