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Beginner's Guide to Audio File Types (And Which to Use)



Though some listeners prefer their shelves of vinyl and stacks of CDs, most music libraries now exist in digital file formats that are more convenient to store and easier to access on the go. But it's not particularly helpful to simply describe an audio file format as "digital" because that can mean different things — and different levels of sound quality. Audio files in fact come in multiple formats, and not all of these formats are made equal.

Audio file formats: A brief overview

One of the major differences between audio file formats relates to a process called **compression**. As its name implies, compression makes file sizes smaller. This can be

useful for saving storage space on a hard drive, but it can also have consequences for the quality of the original audio recording.

The compression process essentially reduces the amount of data contained in an audio waveform, and this loss of data may result in noticeable loss of quality to the listener. Some audio file formats that undergo this **lossy** type of compression include MP3, AAC, and Ogg/Vorbis.

But the compression process doesn't *necessarily* diminish audio quality. Some newer compression technologies manage to shrink the file size while retaining all of the audio information from the original recording; audio files that undergo this type of compression are known as **lossless** audio files.

Finally, there are audio files that undergo no compression. These **uncompressed** audio files are generally much larger in size, but they avoid the audio quality issues that plague some compressed formats.

To recap, digital audio files can be **lossy**, **lossless**, or **uncompressed**. Let's dive deeper into each type and explore some common examples.

Lossy audio files

Lossy audio files are compressed in such a way that some of the original recording's fidelity is lost. You may find it strange that *anyone* would prefer a lossy audio file to one that retains all of the richness and complexity of an uncompressed file. But lossy files tend to take up much less bandwidth and storage space, which makes them a good compromise for music-streaming services.

And before you think "lossy" automatically means "bad quality," consider whether your ears will even notice the difference. Many people find it difficult to detect any difference between CD quality (16 bits/44.1 kHz) and higher bitrate standards, which some lossy file formats technically achieve. If it makes no difference to your ears, it makes sense to opt for a smaller file size when possible.

On that note, let's look at four lossy audio file types you may come across.

MP3

The MP3 audio file format became immensely popular in the early 2000s. At the time, it was among the most efficient ways to get an audio track from a CD and store it on a digital hard drive or on a “burned” CD. The MP3 file format is much smaller than that of an uncompressed CD audio track.

MP3s were revolutionary for their time and led to a huge leap forward in portable listening, as they were the basis for early digital audio players. You may even still have some MP3s stored on your hard drive, but the format is lossy and some people may be able to pick out the difference between an MP3 and a CD-quality track.

AAC

AAC stands for Advanced Audio Coding, which is another lossy coding standard used in audio track compression. AAC quality doesn't rise to the level of hi-res audio but it is a step up from the MP3, delivering better quality at a comparable file size.

Though perhaps not quite as ubiquitous as the MP3, the AAC format is everywhere and you've probably encountered it yourself. It was the preferred format of the iTunes music store and continues to be available on AAC-compatible devices.

OGG

OGG is a versatile and open-source multimedia compression technology. You may have heard of Ogg/Vorbis, which is an OGG format typically used for audio compression. Spotify frequently uses this format for its streams.

Though lossy, OGG audio files retain pretty good sound quality. Their size and quality are both advantages over other lossy compression formats, and they are widely used for streaming audio over the internet.

WMA (Lossy)

WMA is short for Windows Media Audio — a hint that this is a proprietary format developed by Microsoft. Though it achieves slightly better quality than MP3, the lossy WMA format is not widely compatible with non-Microsoft devices and thus has limited utility.





Lossless audio file types

File types for lossless audio are those that are compressed in such a way that the quality of the original recording essentially stays intact. In other words, no discernible aspect of the audio is lost in the process of compression.

Just be aware that “lossless” does not mean uncompressed. A lossless track is still compressed, though it uses a data algorithm to retain all of the original recording’s quality. Lossless quality generally equates to about 16 bits/44.1 kHz or higher, which means it sounds at least as good as a CD.

Below are some of the most common lossless file types.

FLAC

FLAC stands for Free Lossless Audio Codec. A “codec” is basically a process that compresses and decompresses digital files, so the name here basically says it all: This was developed as a free way to achieve lossless compression.

Many audiophiles consider FLAC the gold standard of digital audio formats, as it achieves a much smaller size than a raw uncompressed audio file without sacrificing any discernible audio quality.

ALAC

ALAC stands for Apple Lossless Audio Codec. It was developed by Apple as a lossless successor to AAC. The company currently offers its entire Apple Music catalog in ALAC resolutions ranging from CD quality to higher.

WMA (Lossless)

There is indeed a lossless alternative to the lossy Windows Media Audio format mentioned above. It isn't as common as FLAC and Apple's ALAC, and it doesn't stand out in terms of compression efficiency or audio quality. With that said, this WMA format does offer a lossless audio experience to (primarily) Microsoft users.



Uncompressed audio file types

As the name suggests, uncompressed audio files do not undergo any type of compression. This means that there is no data lost in the process of compression, and every aspect of the original recording is preserved.

Many audiophiles hold uncompressed file types up as the holy grail of digital audio, but these file types come with a few of their own disadvantages. For one, they tend to be quite large; if you store a ton of uncompressed files locally, you'll likely need additional hard drive space. Their cumbersome size also means it may be difficult to find truly uncompressed files on many streaming services.

Let's check out three of the most common uncompressed audio formats.

WAV

WAV (Waveform Audio File Format) is a hi-res audio format used for encoding CD audio data. Though WAV files can technically store compressed data, they are typically used for uncompressed audio.

WAV files are known for their excellent sound quality, but they're also notorious for their very large file sizes.

AIFF

AIFF, or Audio Interchange File Format, is similar to WAV in many ways. (In fact, it was developed by Apple around the same time Microsoft and IBM were developing the WAV format.)

AIFF audio files are comparable to WAV files, and both are generally compatible with Microsoft and Apple systems. But AIFF files are rare and suffer from large file sizes, so you probably won't see them much.

DSD

The DSD (Direct Stream Digital) format is another one that's popular among audiophiles. It aims to capture the original analog waveform in a way that replicates what you might hear coming out of a high-quality record player. Though beloved among a small subset of listeners, DSD hasn't caught on with the mainstream and

uncompressed DSD files are simply too large to make sense for internet-dependent streaming applications.

Which audio file formats should I use?

At the end of the day, the audio file type you use is only as good as the equipment you play it on. If you don't plan to invest in a hi-fi sound system with quality components, it might not matter whether you use an MP3, AAC, or lossless audio file format.

The good news is that hi-fi audio isn't as unattainable as you may think. With a premium speaker like Sonos Five or the spatial audio capabilities of a soundbar like Sonos Arc Ultra, you'll be more likely to discern the differences between lossy and lossless audio quality.

From there, the file format you choose depends mostly on how you listen to music. If you mostly stream music but want the best quality possible, look for services that feature FLAC and ALAC encoding. If storage space isn't an issue and you play mostly files from your CD library, WAV could make more sense.

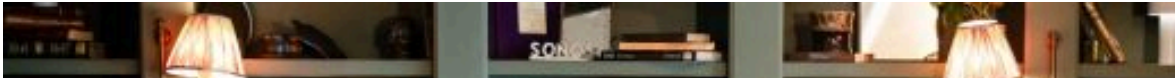
Of course, it helps to be honest with yourself about how much quality really matters. Some people are just fine with lossy formats, and sometimes the convenience of smaller file sizes outweighs any difference in audio quality.

Experience multiple audio formats with Sonos

At this point, you may be wondering what audio formats Sonos supports. Our supported file types include many of the formats mentioned in this guide. This includes high-quality lossless and uncompressed audio encoded using FLAC and ALAC, with a maximum bit depth ranging from CD quality to higher.

Keep in mind that Sonos home theater products may support different audio formats than our wireless speakers and headphones.

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