Coding Delay in Digital Audio Codecs

There is a significant difference in the degree of coding delay among the most commonly used algorithms in digital audio codecs. With their fixed 4:1 data reduction, the G.722 and apt-X formats produce a minimal coding delay of around 6 mS. The delay of ISO/MPEG Layer II coding averages around 1/4 second and ISO/MPEG Layer III coding produces an even higher delay of almost 1/2 second. These figures are for a single pass through an encoder and decoder and do not include transmission delays or a return trip.

Note: ISO / MPEG Layer II produces a delay of 6X the frame length, which varies with the sampling rate used. At 48 kHz sampling, the delay is 144 mS. At 32 kHz sampling, the delay is 216 mS and at 24 kHz sampling, the delay is 288 mS.

The impact of coding delay is most apparent when program monitoring is required on the return channel of the codec. Even with the small delay of G.722 and apt-X, a mix-minus return feed is desirable.

For live, interactive programming such as call-in shows, talk formats, interviews, etc., the higher coding delay of the ISO/MPEG algorithms can easily hinder the flow of the conversation, even if mix-minus and a low delay format are used on the return channel. Therefore, a low delay algorithm may be a better choice.

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