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Wideband Voice

"We don't make the sky, we make the sky bluer"

That refrain sounds like an ad campaign from a Chemical Company. It might not be too long before we start hearing something similar from Voice Over IP Telephony Service Providers and Cable MSOs.

We now have technology available that can do for the sound of telephone calls what High Definition has done for Television, and it is Wideband Voice (also known as High Definition Voice).

What is Wideband Voice? It is the use of coding, decoding, and transport mechanisms that allow for a much larger range of audio frequencies to be conveyed from the talker to the listener on a telephone call. Technically, Wideband Codecs (Coder/Decoders) extend the voice band from its traditional 4 kHz upper frequency limit to 8 kHz or more. The sound quality of Wideband Voice is comparable to that of FM radio broadcasting.

Historically, telephony has been a "communications quality" service, with the bandwidth limited to a frequency response from 300 Hz to 3 kHz. The components required for a traditional call, from the microphone in the mouthpiece, all the way to the earpiece in the far end, were bandwidth-restricted to make sure that the message would get through over a pair of copper wires. In the 1970s, Digital Loop Carrier (DLC) equipment was developed to allow many calls to traverse the same physical facilities. DLC coding schemes adopted the same bandwidth limits as the copper wires and limited call bandwidth to a maximum of 4 kHz. Global TDM (Time Domain Multiplexing) networks fit these standard coding schemes. These coding methods became the G.711 coding specification. All cable operators and most other VOIP providers use G.711 coding today.

G.711 is an excellent codec, but with technical advancement, we can now do better. Modern low-bit-rate codecs can provide fidelity as good as G.711 in a fraction of the occupied bandwidth. Conversely, other codecs can provide higher fidelity in the same (or less) bandwidth than G.711 uses.

Anyone who has tried a "Skype" (computer-to-computer) call will know the benefits of more bandwidth made possible by more aggressive encoding. The problem is that not too many of us are willing to confine our home phone experience to calls made using the computer. For all but the geekiest among us, using a computer to originate and receive phone calls is not acceptable, at least not on a routine basis. So how can we bring the High Fidelity experience of Wideband Telephony to the telephone set, in the same way

VOIP redefined consumer expectations for phone services in terms of features, ease-of-use, Web integration and value?

At least one maker of business class SIP telephones has begun including the G.722 Wideband Codec in their products. When these phones call one another over an IP-based network, they will negotiate a high-fidelity connection. Calls to phones not equipped with the high-fidelity codec negotiate at G.711 and connect with standard 4 kHz audio. I recently conducted a series of demonstrations for colleagues, comparing G.711 and G.722 calls on the same hardware. The difference perceived by the audiences was quite noticeable, particularly with a speakerphone at one or both ends of the call. Wideband voice on a business conference call could improve the quality of the meeting!

This phone maker concedes, with few exceptions, that their present customers only experience Wideband calls within their respective enterprises: a Wideband call is only possible when there is an IP connection end to end. If the call must traverse Trunking Gateways and enter the PSTN (Public-switched telephone network), both ends will revert to G.711 and only a standard quality call will result.

Most VOIP Network Operators complete calls with direct IP connections within their own networks today. It is now possible to conduct Wideband calls between different enterprises on an operator's own network. With adoption of SIP Peering (as described in the previous Media Center: Voice), Wideband calls to other users on other providers' networks will be possible too.

Cable's Digital Voice. We don't make your phone call, we make your phone call sound better.