



iLBC Transcoding for VoIP Service Providers

Ditech Platform

Ditech's Codec Normalization solution is available on the Packet Voice Processor.



Packet Voice Processor™
1000Base-T/SX/LX

As the use of Voice over IP (VoIP) continues to expand, many voice applications are calling for improvements in voice codecs to better accommodate a more complex IP communications environment. With a growing number of VoIP calls using the Internet for transport, carriers are increasingly challenged to ensure quality voice communications to their subscribers. Examples of these challenges include voice over low-bandwidth connections, packet loss due to network congestion, and variable packet latency. Traditional voice codecs fail to perform well under these conditions. As a result, new classes of VoIP-based voice codecs have been designed to better handle these real-world IP issues.

The Internet Low Bit Rate Codec (iLBC) is a royalty-free narrowband speech codec designed for VoIP over public Internet connections. iLBC is standardized by the Internet Engineering Task Force (IETF) in RFCs 3951 and 3952, and it is a component of PacketCable™ voice-over-cable telephony systems standards. In addition to being widely deployed in soft-clients such as Yahoo! Messenger with Voice™, Skype™ and Google Talk™, iLBC is also of interest to traditional carriers.

A primary advantage of using iLBC is an improvement in voice quality, especially

in IP networks. iLBC's speech frames are compressed independently, which gives the codec better tolerance for packet loss and jitter. Since most other low bit-rate codecs retain dependencies between speech frames, packets that are lost or delayed result in error propagation across multiple packets, leading to lower voice quality (Figure 1).

Another benefit of iLBC is economics. iLBC is a royalty free codec, making it less costly to deploy than similar codec types. In addition, iLBC is an IETF standard, eliminating licensing requirements.

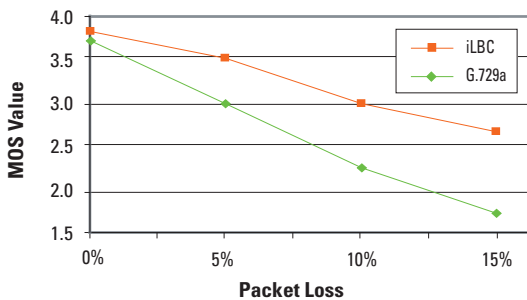


Figure 1 :: Packet Loss Effect on Mean Opinion Score (MOS)

SUPPORTED CODECS

- G.711 μ -law
 - G.711 A-law
 - G.723.1
 - G.726
 - G.729
 - G.729a
 - G.729b
 - G.729ab
 - iLBC
 - G.722*
 - G.722.1*
 - GSM-HR, FR, EFR*
 - GSM-AMR*
 - G.722.2 (AMR-WB)*
 - EVRC, EVRC-B, EVRC-WB (4GV)*
 - Speex*
 - BroadVoice® 16/32*
 - iSAC*
 - iPCM-wb*
- *Future Capability

The Codec Transcoding Solution for iLBC

Ditech's Packet Voice Processor™ changes the rules for supporting new codecs. Built as a carrier-grade platform, the Packet Voice Processor offers providers the ability to significantly enhance service flexibility with support for the industry's most comprehensive set of voice codecs for wireline, wireless, and VoIP applications. The Packet Voice Processor's powerful codec transcoding engine allows carriers to deploy iLBC without upgrading their entire network.

Deploying iLBC

iLBC allows robust, high-quality voice service to be delivered to bandwidth-constrained customers without the royalty costs usually associated with low bit-rate codecs. This provides VoIP service providers with a new opportunity to expand service reach and improve quality.

However, deploying iLBC can be technically challenging using the VoIP equipment that is currently available. Media gateways, media servers, and application servers generally support only a few codec types. In addition, these VoIP devices normally use fixed application processors or low-power DSPs, which reduce total call capacity. A reduction in call density increases the cost per channel because more equipment must be deployed to maintain a specific network call capacity. Adding to this density issue is the requirement that all network media devices support the new codec to provide end-to-end service capability.

Ditech's Packet Voice Processor is the perfect platform for supporting iLBC on the subscriber side with a normalized codec, such as G.711, on the core side (Figure 2). Only the calls that require transcoding are processed by the Packet Voice Processor,

so the cost of deploying iLBC is minimized. Plus, the Packet Voice Processor is a high-performance media processing platform, so deploying additional new codecs to the network is no longer a technical and operational challenge. With an industry leading channel density, the Packet Voice Processor is a cost-effective, long-term solution.

Conclusion

Ditech Networks' Packet Voice Processor with iLBC transcoding solves access problems and enables increased service flexibility while improving economics for VoIP service providers. Built on a carrier-grade platform, the Packet Voice Processor is a powerful media processing resource that ensures flexibility with diverse voice codecs to expand service capability and maximize revenue.

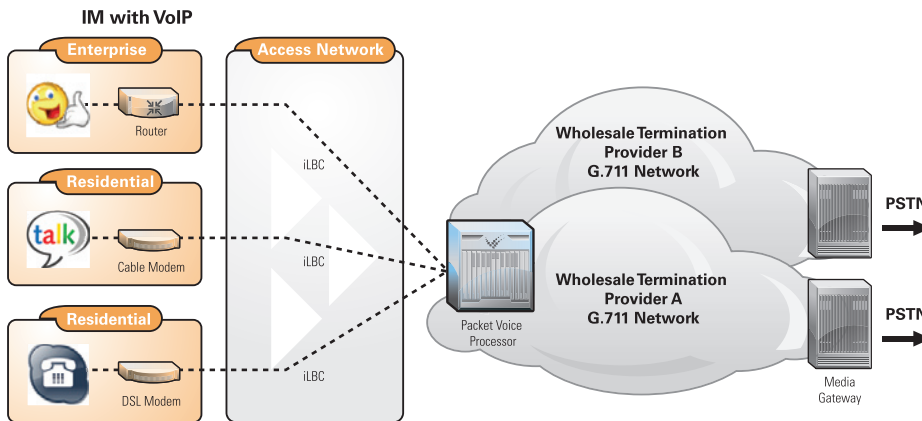


Figure 2 :: Packet Voice Processor iLBC Transcoding Feature