

HD Voice

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Agenda

- What is HD Voice
- Why HD Voice
- Challenges in HD Voice
- TI's Vision for Voice

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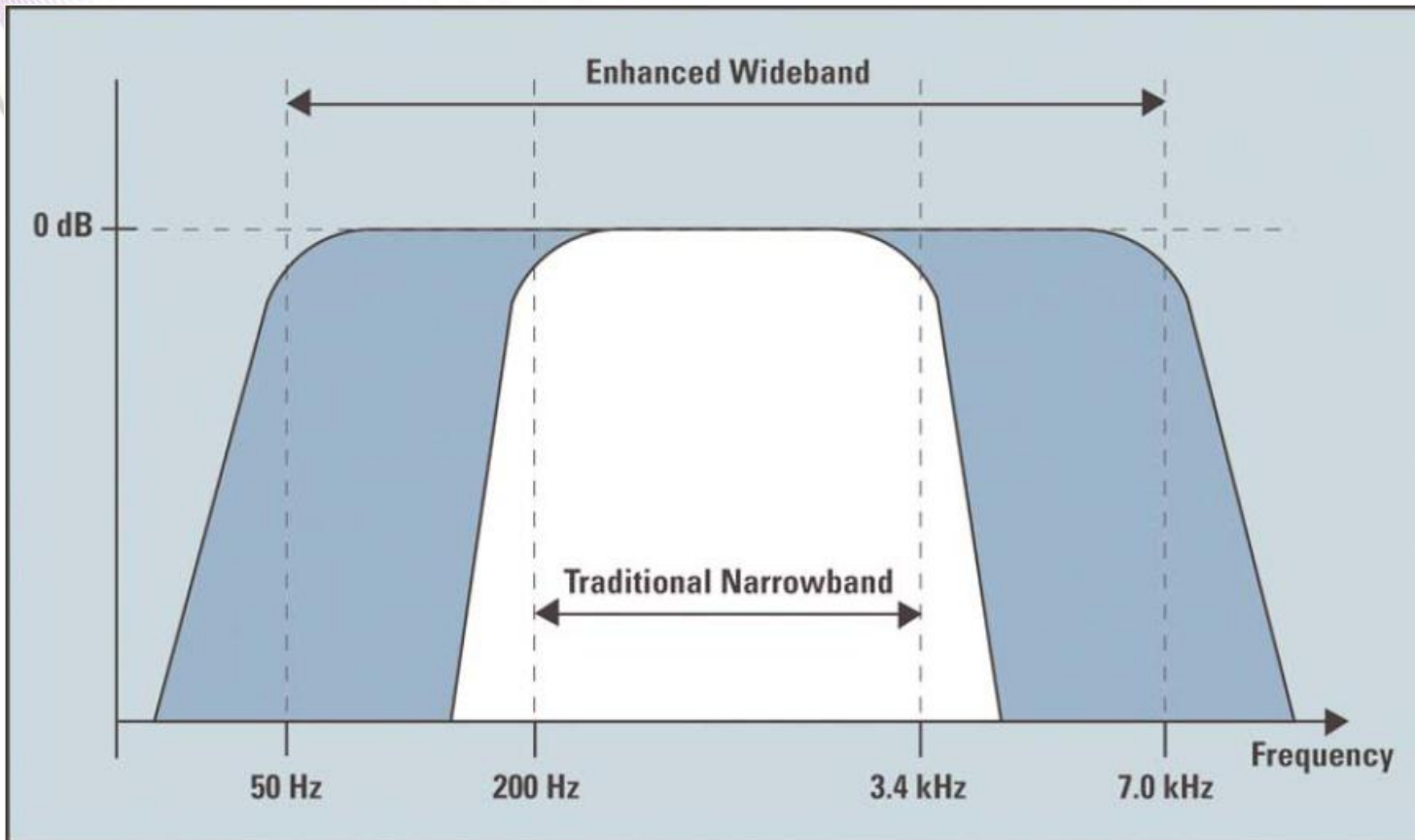
What is HD Voice

- Traditional PSTN (Narrowband Codecs) samples analog signals at 8K samples/second covering sound frequencies from 200 Hz to 3.3 KHz
- High Definition (Wideband Codecs) samples at 16K samples/second and covers sound in the range from 50 Hz to 7K Hz

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Narrowband vs. Wideband



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Comparison of Various Wideband Codecs

Voice Codec	Sampling Rate	Bits/sample	Bandwidth	Speech Coding	Comments
G.711 (PCM)	8 KHz	8-bit	200 Hz ~ 3.3 KHz	64 Kbits/s	
G.722 (SB-ADPCM)	16 KHz	16-bit	50 Hz ~ 7 KHz	64, 56, 48 Kbits/s	
G.722.1 (Transform Coder)	16 KHz	16-bit	50 Hz ~ 7 KHz	32, 24 Kbits/s	
G.722.2 (AMR-WB)	16 KHz	16-bit	50 Hz ~ 7 KHz	6.60, 8.85, 12.65, 14.25, 15.85, 18.25, 19.85, 23.05 and 23.85 kbit/s	
VMR-WB	16 KHz	16-bit	50 Hz ~ 7 KHz	Mode 0, 1, 2, 3	CDMA2000

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Why HD Voice

- Better, more precise comprehension from clearer verbal communication and speech interpretation
- Leading to a more reliable speech recognition system
- HD voice, FMC (Fixed-Mobile Convergence), Dual-mode convergence in handsets

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Challenges in Implementation and Deployment of HD Voice

- Line Echo Cancellation
 - Already challenging in narrowband codecs, will be more challenging in wideband codecs
 - Replacing old two-wire wiring with four-wire cabling is an option but not an economical one
- Transcoding
 - Every processing node in the network needs HD capability
 - Codec negotiation before voice transmission
 - Remains to be seen whether one or more wideband codecs will be widely deployed by the industry

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Challenges in Implementation and Deployment of HD Voice

- Voice Processor Capability
 - Some wideband codecs such as G.722.2 is very computationally intensive especially for MIPS-like processors
 - Advanced DSP technology will come into play
- The Last Few Inches
 - Reducing acoustic coupling in speaker and microphone
 - Most microphones are already HD-ready but HD-ready speakers are not as prevalent

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TI's Vision for Voice

- Imagine a world where every IP connection is voice-enabled; where network connectivity and voice capability become virtually synonymous...
- That's TI's Vision for Voice.

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Thanks!

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