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The World's Premier Supplier of Speech and Audio Codecs





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Enabling High-Quality Speech over Converged Wi-Fi/Mobile Networks

Imagine getting all your phone calls, whether at home or on the road, on a single, personal handset – with not only the convenience of never missing a call, but also just one phone number to remember, one voice mailbox to access, one address book with all the information in a single place, and one bill to pay. This is what converged Wi-Fi/mobile phones are bringing to a growing number of markets around the world.

Finally – a true personal communicator that's always at hand

Dual-mode Wi-Fi/mobile phones provide connectivity to the 2.5G or 3G mobile network for mobile access and Wi-Fi connectivity for IP telephony wherever it's available – starting in the home and office, but also in an increasing number of hotspots in public places such as stores, malls, restaurants, campuses, convention centers and airports. Worldwide, more than 100,000 hotspots – physical addresses where people can connect to a public wireless network – are in operation already, and the number is growing rapidly. In fact, cities like Philadelphia, San Francisco and Toronto are planning to provide ubiquitous public wireless broadband access.

Enabled by UMA (Unlicensed Mobile Access), the 3GPP standard specification for Wi-Fi/mobile convergence, or similar technologies, dual-mode Wi-Fi/mobile phones like the Nokia 6136 and Motorola A910 introduced at 3GSM World 2006 provide seamless, transparent handovers of voice and data connections between GSM and WLAN networks. By mid-2006, there will be fully 20 such devices on the market, according to Informa Telecoms and Media.

Codecs enable digital speech communications

Key enablers of high-quality digital phone communications are state-of-the art, robust and efficient speech codecs. Codecs compress the speech signal into a bitstream for efficient and reliable transport over digital networks and reconstruct it faithfully at the receiving end.

The specific speech codecs to be used at each end point of a conversation are decided during call setup. If different codec technologies are used at the end points or within the network, the speech signals need transcoding. Transcoding is analogous to using a simultaneous translator to mediate conversations between people who do not speak the same language. As in the analogy, transcoding introduces additional delays, cost and potential errors or loss of meaningful information. It should therefore be avoided whenever possible. Networks are evolving toward fully digital tandem-free operation, which will eliminate transcoding when the end-point codecs interoperate, so the mandatory codecs already standardized, deployed and market-proven in mobile networks are the best choice for Wi-Fi phones and prepare the ground for transcoder-free communications between networks while delivering top-quality speech now.

Standardized codecs provide transcoder-free interoperability

The standardized codecs used in mobile communications bring proven quality, interoperability and a pedigree that reflects coordination of the public and private sectors and includes all the benefits of published algorithms and source code. VoiceAge, together with Nokia and Ericsson, pioneered the development, standardization and commercialization of the AMR family of codecs. As one of the inventors of this technology, we have leveraged this expertise to develop unrivaled codec implementations that can help you deliver the best speech and audio quality over converging fixed/mobile networks.



AMR

The proven, highly efficient and very robust Adaptive Multi-Rate speech codec, AMR, standardized and adopted by the 3GPP, is the mandatory codec for narrowband telephony in 2.5G networks with evolved cores and 3G W-CDMA networks.

AMR is the most widely deployed low bit rate narrowband speech compression technology in the world today. Operating at eight different bit rates from 4.75 to 12.2 kbps, AMR delivers toll quality speech starting at 7.4 kbps and very good quality at lower bit rates. AMR interoperates transcoder free with legacy mobile equipment. Moreover, its adaptive bit rates can be used to increase network capacity, supporting more users at a lower bit rate during high-traffic conditions. AMR can also adapt to varying mobile network conditions by trading off quality for service continuity. When channel conditions degrade, AMR can continue sending a clear speech signal at a lower bit rate so that more bandwidth can be used for channel coding, thus ensuring service continuity.

AMR is already built into every GSM and W-CDMA phone, ensuring that content generated by AMR can be played by virtually any wireless phone in the world – including hundreds of millions of new phones every year. It is also the mandatory codec for 3G H.324M terminals supporting video telephony and the default codec for Multimedia Messaging Services (MMS) as defined by the Open Mobile Alliance (OMA).

Using the AMR speech codec for Wi-Fi telephony will bring transcoder-free interoperability with mobile networks while providing top speech quality wherever users access their networks, leading to better quality sound, less delay and lower cost due to the elimination of transcoding.

AMRWB

The proliferation of the Internet worldwide raises the possibility of a new level of enhanced quality for speech. Wideband telephony more than doubles the sampled bandwidth of traditional telephone networks, delivering much richer and more intelligible sound.

The superior quality of wideband speech is a clear differentiator for voice on the net. The enhanced user experience can help VoIP providers attract and retain customers, encouraging conversions from the PSTN and increasing providers' market share while adding value to their service offerings.

The 3GPP standard AMR-Wideband codec for wideband speech communication – also standardized in ITU-T as G.722.2 – builds on the same technologies used in the market-proven AMR codec. AMR-WB is adaptive in the same way as AMR and operates at nine bit rates from 6.6 to 23.85 kbps. Moreover, AMR-WB is the first and only codec that can interoperate directly between 3GPP (GSM/W-CDMA) and 3GPP2 (cdma2000®) wireless networks and ITU-T wireline systems without transcoding. And in addition to telephony, its richer sound opens the door for a new generation of services such as great-sounding ringtones and multimedia conferencing. AMR-WB/G.722.2 is the mandatory codec for wideband (50-7000 Hz) telephony in next-generation networks.

Implementing AMR-WB will enable transcoder-free interoperability with 3GPP and 3GPP2 wireless and ITU-T wireline systems for wideband telephony with excellent speech quality.



Wi-Fi/mobile convergence

Demand is strong

Over 80% of businesses have an interest in Wi-Fi/mobile convergence (Instat). Up to two-thirds of mobile minutes of use in Germany take place within the home (O2 Germany). If mobile calls in the home were priced the same as fixed-line calls, over 50 percent of people surveyed would sign up for converged Wi-Fi mobile service within 12 months (Motorola).

Convenience wins users

Seamless interoperability and handovers mean convenience for callers.

Costs go down

WLANS are simple and low cost to install and maintain compared to the equipment that would be required to increase cellular coverage in the same areas. Their unlicensed spectrum has no initial licensing costs, and WLAN access points can be easily installed at much lower cost than mobile base stations. These savings can be passed on to users.

Call quality improves

Cellular coverage within buildings is notoriously uneven and is getting even worse in the spectrum used by 3G, while WLANS are able to cover even heavily trafficked environments.

Interoperability drives usage

Services available on the mobile network will be available on Wi-Fi. Lower rates for Wi-Fi calls may well remove the important barrier of cost anxiety and lead to greater uptake of data services and higher returns for providers in the medium to long term.



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