Advisory Report

Wideband Audio in the Enterprise – Challenges Persist

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Summary

Though high definition (HD) voice now has the backing of many leading developers, widespread adoption in the business communications market has been elusive and is unlikely to reach its inflection point in the near term.

So what are the challenges that have impeded widespread adoption of HD voice and when will it be more prevalent in business markets? When it does become more mainstream, and what should business customers and developers expect?

Current Perspective

HD voice solutions have been available since the early part of this decade and, although enterprise adoption of the technology is increasing, deployment of HD voice has not yet lived up to initial expectations. The value propositions and usefulness of HD voice is not in question, yet there remain numerous causes for slow traction in business markets.

• **Nice to have vs. mission critical:** Most of today's workers accept toll quality as the benchmark for voice quality. The PSTN is designed to transport sound frequencies from 200 Hz to 3,400 Hz in 64 kbps bandwidth and omit sounds that fall outside of this spectrum, whereas HD voice technology can support frequencies from 50 Hz to 7,000 Hz in 32 kbps. This allows HD voice to deliver a much broader and richer range of sounds to be naturally transmitted, but the difference in quality is something better realized live by customers. As a result customers usually have to experience HD voice to truly grasp its superiority. Even then, it can easily be viewed as a "nice to have", but not mission-critical to enterprises as they seek ways to facilitate communicate between employees, partners and customers,

• **ROI:** Like many solutions in the enterprise communications spotlight today that promote intimacy and productivity as top value propositions, ROI for HD voice technologies is difficult to quantify. Enterprise decision makers are skeptical whether the ability to identify a conference participant by the sound of his/her voice more easily actually does improve

Current Analysis
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intimacy or productivity. Quantifiable savings from such soft benefits are difficult to prove, making upgrades to HD voice technology a hard sell, particularly in today's economic climate.

• **HD Islands:** Chief hurdles to HD voice adoption are tied directly to continued reliance on the PSTN. Any HD voice transmitted over PSTN is degraded to narrowband, thus losing the full sound spectrum associated with the HD call. This means that HD voice sessions must be transported over an all-IP network capable of end to end support. Connections between service provider networks also need to be IP-to-IP, with no part of HD calls transmitted over PSTN. Customers that have implemented HD equipment may often find that the full benefits of their HD investments are available only during intra-company calls, with high-quality HD voice lost on calls coming in from or leaving the LAN. To sell more bandwidth, a handful of ITSPs now promote support for HD voice on their IP networks, but business customers will often find that this benefits only calls between their office locations, or to the minority of other businesses that have signed up for similar programs.

• **IP Phones:** Developers of IP business phones have been among the most aggressive proponents of HD voice technologies. Through its R&D work in the late 1990s, Polycom has mind share as an early proponent of the technology. However, most voice systems developers and independent IP phone vendors offer desk sets with HD support today. Several years ago wideband IP phones were more expensive than narrowband phones. Early HD sets targeted executive users, with HD support in entry level phones scarce. This has begun to change due in part to the presence of more developers and wider selection of available products. Some HD phones are now priced similarly to narrowband devices, and more entry level phone models are being introduced with wideband codec and hardware support.

• **Compatible or Capable:** Although many IP phones now support G.722 wideband codecs, making them HD compatible, this does not necessarily make them fully HD capable. Not only must standards-based wideband codecs be supported, but IP phones must be outfitted with HD microphones and speaker hardware to truly offer an HD experience. In some cases, such as with snom's 300 IP phone series and several Cisco 7900 models, narrowband handsets can be upgraded with handsets featuring wideband speakers and microphones. However, a lack of wideband codec support in all but the latest IP phone models, as well as physical internal design limitations of most narrowband IP speakerphones makes it impossible for them to be upgraded for true wideband voice support.

• **HD Enterprise Voice Networks:** While some vendors take end point or applications approaches to implementing HD voice, others are taking a network approach. For example, AudioCodes is working toward a direction of supporting HD voice across networks by embedding support for multiple of wideband codecs (G.722, G.722.2, AMR and Microsoft RTA) into all of its enterprise and carrier gateways. With this approach AudioCodes intends to use SIP to negotiate codecs to facilitate use of HD voice services across multivendor environments. (Note that AudioCodes has also launched its own line of wideband IP phones.)

• **Fostering Interop:** A number of available customer case studies proves that it is possible to deploy multivendor HD voice solutions and still reap the benefits of the high call quality that HD promises. It was not so long ago that customers had few models of IP phones and fewer PBXs to choose from that supported wideband audio. More pervasive support for HD voice codecs by PBX suppliers, a steadily expanding stream of standards-based HD IP phones on the market, and interoperability of standards-based equipment has greatly expanded customer choice.

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Progress is being made to clear some of these hurdles. HD voice codec support is quickly becoming a checklist item for enterprise voice systems and endpoints. Interoperability issues between various HD voice codec standards are being worked out. A continued influx of HD voice products from a wider range of vendors will help to drive pricing downward. Additional HD voice service offerings will be introduced by carriers seeking differentiation. Despite progress in overcoming these hurdles businesses are likely to make HD voice a consideration as part of their more substantial infrastructure refreshes rather than ripping and replacing their existing solutions. As a result it will take years of growing momentum before HD voice approaches mainstream status within the enterprise.

Recommended Actions

Recommended Vendor Actions

• Vendors should make support for wideband codecs a standard feature of their communications systems and end points (IP desk phones and soft phones). Customers should not have to pay extra for the capability. Rather customers should be offered HD-ready functionality as integral to their communications systems.

• IP phone developers should also continue to offer handsets with wideband audio components as optional. This will allow customers to upgrade IP phones cost-effectively in the future to reap the greater benefits that will be available when HD voice becomes more prevalent.

• With more choices now available vendors can no longer position their wideband phones as differentiators. Developers will have to move the focus of their value propositions up the stack to applications. Support for HD audio conferencing, for example, is low hanging fruit in terms of addressing problems associated with narrowband voice that most businesses know all too well.

• As always, developers should support industry standards and implement them in a consistent way. They will want to ensure that their products do not create 'walled gardens' of HD voice. They will add a lot of value to their product positioning by being able to integrate with third-party offerings that are also standards-based.

• Enterprise voice systems developers should identify and add service providers to their partner ecosystems that offer HD voice services to businesses. The combined product and service solution has the potential to expand the frequency and number of wideband calls that can be connected enormously.

Recommended User Actions

• Businesses considering HD voice solutions should investigate the extent to which their existing infrastructure already supports the technology. Many PBX systems and gateways now offer HD voice codec support as standard, while existing IP phones can variously be upgraded to support HD voice.

• To add a bit of future-proofing to their purchases, businesses that are currently shopping for a new voice system should include HD voice support as a requirement in their RFPs.

• Customers deploying wideband IP phones should do so in volume. Rolling them out departmentally will be of little value since users that have the functionality will lose high fidelity audio when calling colleagues outside of their department.

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• Interested customers should consider wideband phones from their PBX supplier rather than shopping with price as a priority. Deploying third-party phones often reduces call control feature set available to users while at the same time adding complexity to device management and provisioning.

• Customers that utilize speech applications, call recording and audio conferencing as part of their daily business communications should investigate the benefits, as well as the drawbacks (i.e., overly sensitive speech recognition applications or microphones), that HD voice can offer.