



Headsets in an IP Telephony Environment: Enabling Real-Time Collaboration

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Abstract

More than just a convenience, headsets facilitate collaborative communication, and dramatically impact VoIP user perception of audio quality in a VoIP system. Evaluating and selecting the right headset as an integral part of your company's VoIP implementation allows you to define a complete solution optimized for the demands of your business be it mobile or desk-based. As the leading provider of enterprise-quality corded and wireless headsets, Plantronics offers an array of VoIP headset communication solutions that help your business get the most out of your VoIP investment.

Headsets in an IP Telephony Environment: Enabling Real-Time Collaboration

Headsets are playing an increasingly more pervasive and vital role in the enterprise, delivering far more than just hands free computing. With next-generation collaboration applications coming to market from IBM, Microsoft, Cisco, Avaya and others, its becoming critical to stay connected with the rest of the organization. The wireless headset, tightly integrated with these next-generation applications is creating a real-time connected workforce.

How Headsets Enable Real-Time Collaboration

- Headsets allow users to communicate in real-time without shackling workers to their desks, even when in the office. By staying connected (wirelessly) headsets allow workers to remain connected to their communication applications residing on both fixed and mobile communications platforms including deskphones, PC, and mobile devices.
- A well-chosen headset can enhance the VoIP experience even when the network or other system components are not performing optimally. Intelligence in Plantronics enterprise-grade headsets can compensate for many system shortfalls to improve the user experience and productivity.

For example, when Carlos uses his softphone application on the PC speaking to another PC telephony user, there may be considerable echo that makes the conversation less intelligible. With the intelligence designed into Plantronics enterprise headsets, echo is mitigated and the PC becomes a more viable higher fidelity communications platform for voice applications.



Another example is when Jill is listening to her voice mail via her email (unified messaging); she can maintain the privacy of the message and avoid disturbing her cubicle neighbors by using her Plantronics wired or wireless headset in conjunction with her PC email/voicemail application.

The Role of Headsets in IP Telephony

Enterprise communications infrastructure is comprised of multiple components spanning the network, application, device, and headset layers. Altogether these comprise an end to end system that when designed properly allow voice applications to perform well. Compromise anyone of these components however and the total systems performance is negatively impacted. For example, if the network hasn't been fully upgraded to ensure QoS for voice traffic, or if an IP telephony application is running on a PC burdened by other demanding applications, the user experience will be compromised.

Holistic System Performance



The headset represents the last mile, or in this case, the last hop. It's not only the most personal component, but it has a significant impact on the user experience on how the system performs as a whole.

Therefore, it's important that the headset be an integral part of the IP communications infrastructure design. When using Plantronics enterprise-grade headsets, intelligence in the headset can then compensate for many environmental and network factors when needed, as well as supporting how the applications and devices can best support the need for real-time communications.

Not only that, but many companies spend millions of dollars a year on headsets without even realizing it. Headsets represent a major capital investment.

Voice: Not Just Another Application

Not "just another application on the data network," VoIP introduces new challenges to meeting well-established user expectations for telephony performance. The right headset can, however, help minimize the impact of the following network issues:

- **Echo:** A properly selected headset can help with both prevention and echo management. The physical coupling of the headset (how the earphone fits to the ear) and the boom design (positioning of the microphone relative to user's mouth) helps prevent echo -- and digital signal processing (DSP) assists echo management when it does occur.
- **Latency:** Time lag due to information being sent and received across the network. This can cause callers to stop and start speaking again, speak over each other, and in similar ways interrupt the natural flow of conversation. Network latencies create diminished voice quality.
- **Distortion:** When the high end and low end of the signal are clipped the resulting sound may sound distorted, nasal, or as if the other person were speaking from within a barrel.
- **Artifacts:** Any bits that get dropped during signal transmission cause pops and ticks in the resulting sound.
- **Narrow band/wideband mismatch:** Narrow band telephony is actually less than the natural speech range, while wideband is the full range of natural speech including those areas of the spectrum contributing directly to greater intelligibility. Mismatch has to do with operating a wideband device (headset) in a narrow band environment. Truncated content creates pops and clicks, similar to screen artifacts in video. The headset must be designed in such a way to prevent adding any artifacts in the bandwidth outside of narrow band. Artifacts distract the user and degrade the sound experience.
- **Staying connected:** Real-time communications requires staying connected via multiple communication channels and being able to easily switch between them.

Optimizing User VoIP Experience with Headsets

Sound excellence: Based on our experience with headset and sound quality issues, we have collaborated with enterprise communications vendors to optimize audio sound quality.

- We use both hardware and software echo management along with correct signal processing to optimize audio performance.
- DSP (digital signal processing) is a technique which, when properly implemented, can create a better sound experience. Not all DSP implementations are created equal. DSP can be used to mitigate echo, unequal call levels, anti-startle from sudden increases in amplitude, and acoustic shock from prolonged exposure to high amplitude.
- Noise-canceling microphones and custom algorithms, ear gels designed to provide better sound isolation of transmitted and received information, and longer boom microphones all contribute to high-performance in a VoIP system
- Full echo cancellation which removes the possibility of the headset contributing to echo, and attenuating the sound below a certain level to ensure sound coming through the speaker does not get transmitted through the microphone.

Multi-modal connectivity: This means one headset bridging many modes of communication. Plantronics enterprise headsets can support multiple applications and different devices such as desk phone, mobile phone, computer, personal digital assistant, and have multiple live links.

Application-aware solutions: Headsets can offer different benefits for different enterprise applications.

- For road warriors, headsets can integrate directly with enterprise softphones to provide important features such as call management, notification in the headset when a call is received, and the ability to answer from the headset.
- In the contact center environment, PerSonoPro middleware optimizes softphones as a communications platform. It tracks noise exposure over time for safety compliance, controls the desktop receive and transmit volumes to ensure a consistent customer experience, and in conjunction with the headset addresses the health and ergonomic issues of prolonged phone usage.

User-centric design: With something as personal as a headset, one size does not fit all. Plantronics has studied literally thousands of ears to create headsets superior in comfort and style. We offer a broad professional product line with styling and feature sets to suit all enterprise use cases.

What Makes an Enterprise-Class Headset

Beyond the criteria required to deliver superior audio in a VoIP environment, several important factors differentiate a truly enterprise-class headset from a consumer grade headset.

- **Durability:** Plantronics headsets have a reputation for physical durability. We provide headsets for customized applications including the military and NASA that perform in demanding environments.
- **Comfort:** Designed for all-day wearing, Plantronics has headsets that provide comfort for both listening and wearing.
- **Audio quality:** Superior audio quality allows more natural and productive business conversations. With travel budgets on hold and geographically dispersed teams, productive teleconferencing is key to getting the job done.
- **Customer service:** You can feel confident that you are entering an ongoing relationship with Plantronics for pre-sales field support, service, and support.

Why Choose Plantronics?

Enterprise-class solutions: Plantronics headsets lead the industry in reliability and durability, so they'll perform as expected in your business-critical communications. We have headsets that promote worker safety, function in both harsh environments and in mission-critical applications.

A significant number of our customers have large scale deployments ranging from 10,000 to 100,000 headsets. For example, customers with 50,000 or more headsets include American Express, Bank of America, Boeing, Citicorp, IBM, Intel, Microsoft, SSA, and Wells Fargo.

World-class partnerships: Plantronics has strong relationships with communication leaders including Avaya, Cisco, Polycom, Nortel, Microsoft, Siemens, NEC, Nortel, 3Com, Ericsson, Alcatel, ShoreTel, Inter-Tel, and Mitel. We have collaborated with these companies to create headsets that are seamlessly integrated with their products and support future functionality.

Mission-critical support: We also provide guaranteed 48 hr repair/replacement service (available in most regions) and technical support in 148 languages.

Investment protection: Strong partnerships and sound innovation built into Plantronics headsets means that your investment today allows forward compatibility tomorrow as your IP communications infrastructure evolves. Plus, we maximize your workforce productivity with demos and training.

Global programs: Save time and money with streamlined procurement for your locations around the globe. Plantronics can create recommended headset lists customized for each geography and application, fulfilled through your trusted communications vendor.

Leadership: Plantronics has been a leader in audio communications since the 1961 mission to the moon. Plantronics currently has 111 issued utility and design patents and 99 U.S. pending utility and design patents. Additionally, Plantronics contributes to a number of standards committees including the international acoustics board, TIA (Telecommunications Industry Association), ITU-T (International Telecommunications Union Technical standards group), IEEE (Institute of Electrical and Electronics Engineers), BT SIG (BlueTooth special interest group), and DECT Forum (Digital Enhanced Cordless Telecommunications).

Recommended & Compatible Plantronics Headsets

Plantronics provides headsets that work with many devices and multiple applications to bridge the multi-device divide. Your investment will serve you well now and in the future.

	Corded Headset System		Wireless Headset System
VoIP Desk Phone	TriStar* SupraPlus NC* SupraPlus VT Encore* StarSet	} + M12*	CS50* CS55* CS60* SupraPlus Wireless* CS70 Voyager 510S
VoIP Softphone	TriStar* SupraPlus NC* SupraPlus VT Encore* StarSet		DA60* DA55* DA40

***Recommended for VoIP**

What happens if you use a headset that is neither recommended nor compatible? Recommended headsets are the best selection of headsets we make—both in terms of a general high-quality headset and VoIP-specific criteria. These headsets ensure an optimal communication experience in the widest array of environments. Compatible headsets are still likely to produce good results. However, if you use a headset that is not recommended or compatible, it doesn't mean the headset will have problems—just that the risk is slightly higher.

There is a list of recommended headsets posted on the Plantronics VoIP web page, under World Class Partnerships: <http://www.plantronics.com/voip>.

Summary

Plantronics, with its history in headsets and communication technology and strong relationships with all the VoIP market leaders, has larger role in the success of a VoIP rollout than you might realize. Not only are our lines of contact center and office headsets used with IP desk phones today for voice enhancement, we deliver solutions with additional functionality truly optimized for IP communications. The tight integration of Plantronics enterprise headsets with enterprise PBX and IP infrastructure, and real-time communications applications—together with adherence to the highest telephony standards—ensure the best performance of your next generation IP communications solutions.

Headsets dramatically impact VoIP user perception of audio quality. We add more value by allowing users to seamlessly support multiple devices with a single headset solution. Companies that incorporate headset planning into their IP telephony and collaboration solutions planning are best positioned to make the right design decisions in optimizing the specific configurations and use cases that are being adopted throughout the company.