



LEVERAGING THE
VALUE OF
COMMUNICATIONS
IN THE ENTERPRISE:

Voice, Video and
Unified
Communications

A Frost & Sullivan White Paper

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EXECUTIVE SUMMARY

These days, companies dealing with new communications challenges cannot avoid hearing about three key technologies: Voice over IP (VoIP), unified communications (UC), and the resurgence of video conferencing—all running on IP networks via Session Initiation Protocol (SIP). VoIP is changing the economics, management and control of enterprise telephony. Unified communications—which integrates presence, chat, voice and conferencing into a single experience and allows users to literally click to communicate—is changing the way employees interact and collaborate. And video conferencing—spearheaded by high-definition and telepresence systems, as well as significant improvements in ease of use—is allowing virtual workers to meet face-to-face without having to leave their offices.

All three technologies are well served by the growing number of high-bandwidth IP networks being used to carry communications in the enterprise, and by the growing maturity of the SIP standard; all support the new way of doing business in the global economy; and all offer significant productivity and ROI benefits. Which raises the question: If each technology is valuable alone, wouldn't they be even better together?

The answer is yes, but getting there isn't easy. It's critical to choose the right architecture and the right vendor to ensure that your UC implementation can support your video conferencing infrastructure, and vice versa. That means having an open, SIP-based architecture that enables seamless integration between your chosen UC client and all voice and video-conferencing endpoints—not just VoIP and PC-based video, but desktop, room-based and telepresence systems as well. It means extending presence information to video conferencing, so that participants know who's available to meet, when, and where. And it means having a dial-tone-like experience for all communications—not just voice, but data and video, too.

Companies that connect all modes of collaboration, on any device, can expect to see significant value. Including video in a unified communications implementation ensures that users will leverage the technology to its fullest, as well as reap the benefits of face-to-face collaboration without having to leave their communications environment—or their office. Running SIP-based applications on an IP network ensures they can integrate as needed, and deliver cost and management efficiencies. That, in turn, ensures much higher usage rates and satisfaction levels, which boost productivity and strengthen ROI.

This whitepaper outlines the key trends Frost & Sullivan is seeing in enterprise communications, and then offers best-practices recommendations for integrating VoIP, unified communications and video conferencing over an IP network to achieve a complete collaboration solution.

KEY TRENDS IN ENTERPRISE COMMUNICATIONS

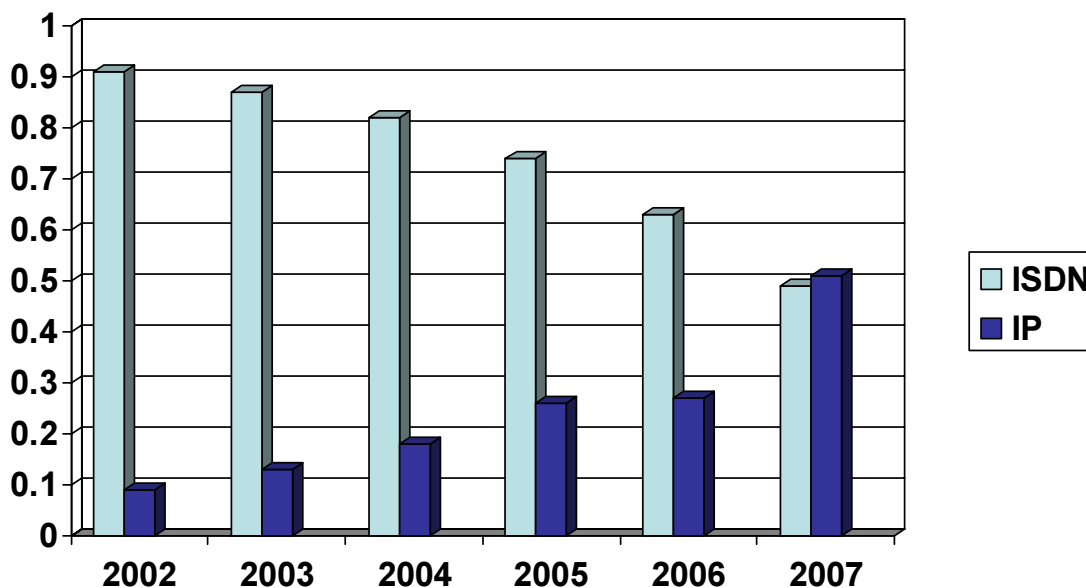
These are heady days for enterprise communications, as technologies must both enable and support the growing virtual workplace. In a virtual organization, workers are located in places separate from those of their co-workers, managers and reports. Even an employee based at corporate headquarters can be a virtual worker if the people he or she regularly works with are located somewhere else; as a result, the number of virtual employees is rising at an enormous rate. That, in turn, is having an impact on the types of communications tools companies are deploying, and the way in which they do so enterprise wide.

The Move toward IP and SIP

IT managers are running communications over IP networks in record numbers, and for good reason: The technology works, it saves companies money and is easier to manage, and it can support next-generation collaboration tools, including presence, video and web conferencing. No wonder such deployments are moving beyond pilot projects to enterprise-wide roll-outs.

Most companies start by running voice over their IP networks, and then almost immediately look for the next technology to take advantage of the new network. Often, that's video. (Please see Figure 1.) Running communications over an IP network delivers several benefits, including lower costs for voice and video calls, and easier integration and management.

Figure 1: Videoconferencing Services Market: Percent of Video Calls by Network Type (U.S.), 2002-2007



The Session Initiation Protocol (SIP) has become the dominant protocol for supporting Voice over IP (VoIP) and other communications applications. According to Frost & Sullivan research, more than 50% of all voice systems shipped in 2007 are SIP based. SIP has overtaken other call setup protocols such as H.323 in part because SIP is based on other dominant IP protocols such as HTTP. This makes SIP-based VoIP services easier to integrate with other IP-based applications, paying dividends in development costs, time-to-market, and application reliability.

But the inherent interoperability advantages of SIP over competing protocols don't guarantee plug-and-play operation among equipment and applications from various vendors today. The SIP standard, and related standards such as SIMPLE (for IM), are young. Implementers sometimes have several choices over which part of the standards to use, and different vendors may choose different approaches. Companies should use products that are 100% SIP, and built that way from the ground up, for maximum interoperability success.

Sip-Enabled Voice over IP

Voice over IP has been deployed in both business and residential environments for many years. The original driver for VoIP deployment was simply cost: By transmitting voice calls over the Internet—or over enterprise private lines, or VPNs—customers could avoid local and long distance per-minute charges, a process called “toll bypass.”

In some early deployments, VoIP service didn't match the quality and availability of “Plain Old Telephone Service” (POTS), and many users were consequently hesitant to adopt it. But since those early days, VoIP technologies and products have been proven in many different network architectures and usage scenarios. Today, rather than having to justify their use of VoIP, most IT managers would have to explain why they're *not* using the technology.

As VoIP has evolved and matured, the industry has accepted SIP as the fundamental protocol for establishing and sharing information about calls. (A standard and broadly accepted protocol is needed so that handsets and PBXs from one vendor can communicate across network equipment from another vendor, and place calls to handsets from still another.) But in addition to supporting basic operation of VoIP services and equipment, SIP adds capabilities that POTS does not.

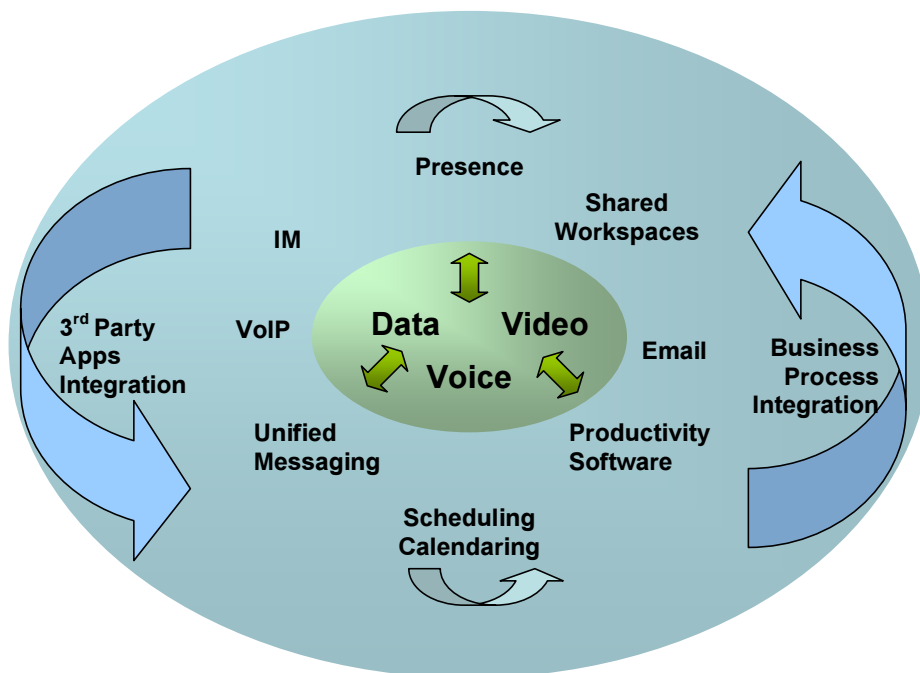
Since SIP is an extension of IP, application and device suppliers can make use of the standard to offer much friendlier user interfaces to the customer's voice service. Call records that tie into an enterprise database, or applications that allow a worker to change his or her voicemail greeting based on time of day or calling party, can enhance productivity with a relatively low investment. SIP-enabled access to voice services has given VoIP a new value proposition beyond toll bypass, one that will become more important as the per-minute price of traditional phone service drops, and as companies max out the cost savings delivered by Voice over IP.

Unified Communications

As the number of remote and virtual workers grows, companies are looking for ways to help those employees connect, communicate and collaborate across geographic and cultural boundaries. While the number of communications options is growing for enterprise employees—including e-mail, phone, IM, web conferencing, audio conferencing and video conferencing—the disparate applications must be supported by a single, easy-to-use front-end that allows the user to choose the method that makes sense in real time, based on the nature of the task at hand, and the availability (or presence) of colleagues. This is the premise—and the promise—of unified communications.

Unified Communications is the merging of telephone, e-mail, conferencing, presence and instant messaging functionality into a single application that serves as the standard communications environment for the office worker. UC includes VoIP technology for point-to-point calls, presence awareness, chat capabilities, the ability to transparently connect to mobile colleagues, and voice, video and web conferencing. (Please see Figure 2.)

**Figure 2: The Unified Conferencing and Collaboration Paradigm
“Click to Collaborate”**



UC recognizes that different communications methods are appropriate to different tasks—and that the most appropriate method may change in the middle of a discussion. A casual conversation about an upcoming meeting among potential partners may suddenly reveal an immediate and urgent need to share a financial analysis of the parties involved.

Instant messaging worked for the initial, casual discussion; sharing and marking up a spreadsheet may be more appropriate for the financial review; and launching a video conference is most appropriate should the discussion get complicated, difficult or strategic.

We are accustomed to making these adaptations in a traditional work environment: the phone call to alert a colleague of an incoming e-mail, the brief IM exchange to arrange a telephone call. Unified communications provides much greater flexibility and support to knowledge workers as they hop from one communications medium to another. The identity and presence status of each colleague provides a stable and consistent framework, allowing users to quickly navigate through different communications channels.

High Definition Video Conferencing

Telephone conversations, e-mail exchanges and IM chats have one fundamental flaw that continues to disrupt effective communication: Participants receive few clues about other participants' state of mind, comprehension or interest level, especially when they don't know one another. Web-based voice conferencing solutions try to address these limitations with user interfaces that allow conference participants to signal their reactions to the speaker and ask questions, but nothing is as good as talking face-to-face—that's why even in the age of high gas prices and cramped and cancelled flights, many far-flung employees continue to travel in order to interact with co-workers, partners and customers.

Video conferencing solves this problem by enabling face-to-face meetings, virtually. But while video conferencing is one of the oldest communications tools, it's also one of the most underutilized, largely because of its reputation for being an expensive, complex and quality-challenged technology that has never lived up to its promise.

That all changes with high definition video technology, which is the first significant improvement to video since color replaced black & white. High definition video resolution (1280 x 720 pixels at 30 frames per second) delivers nearly 10 times the quality of standard definition video conferencing systems, as well as 30 frames per second (fps) at every bandwidth. HD video also delivers hi-fidelity, CD-quality audio and a 30-degree viewing angle to better match the human visual field. Participants appear and sound truly lifelike, and everyone gets a true "you are there" experience.

Bringing it All Together

Voice over IP is often a company's first introduction to the benefits of IP-based unified communications. VoIP offers significant cost benefits, as well as the ability to manage and control calls simply and easily, from both an administrative and end-user point of view. At Frost & Sullivan, we believe UC applications must integrate VoIP and related call-control features, such as unified messaging and find-me/follow-me capabilities, to be truly

effective. But they must also include presence, instant messaging, and various conferencing capabilities in order to truly deliver anytime/anywhere communications to increasingly virtual workers.

The goal is to help employees connect, communicate and collaborate from any device, no matter where they are (the office, home, the road, or across the world). Letting end users click to communicate within a single user interface gives them the power to choose the best communications tool for any given task—and to change those tools on the fly, as circumstances dictate. Integrating video into UC is especially valuable here, because it ensures employees can collaborate using the most appropriate technology—ranging from desktop video to executive appliances to room-based systems—depending on their needs, network and location.

So, for instance, a sales manager might receive an urgent e-mail from an associate in the field, and send him an IM back with an immediate reply. Seeing that the manager is available for a call, the representative may choose to phone the sales manager to further discuss the problem (the call will be routed to the manager's chosen location—desk phone, cell phone, etc.—with no effort on the part of the representative, who simply clicks on the manager's name to place the call). Together, they may opt to share a spreadsheet or other document regarding the account, and then launch a video conference with the regional VP to discuss their strategic plan. The representative may be using a PDA, while the manager is on his or her PC, and the VP joins the meeting in a conference room. The point is that they can all communicate from anywhere on any device, and they can use the applications that best meet their needs at any given point in the process.

Still, even today's most forward-thinking businesses may resist deploying a completely new and separate infrastructure to support new communications technologies. VoIP, unified communications and video conferencing are most successful when they're deployed as part of an integrated communications infrastructure, over an IP network, and built on SIP standards. That gives end users a choice about which tool(s) to use at any given time and for any given purpose, while ensuring IT can manage and control the technology as needed.

ENABLING TRULY UNIFIED COMMUNICATIONS

To truly enable unified communications, companies must take two perspectives into account: the end-user experience, and the back-end infrastructure.

For the end user, UC applications must deliver a seamless experience, regardless of what device they may be using, or from where they may be using it. End users need access to presence information as it pertains to their contacts' availability online and on the phone, but they also need to see calendar and scheduling details to best arrange video conferences and other room-based meetings. They want to be able to move from one

mode of communication to another with the click of a button, so they can escalate collaboration sessions as needed. And they don't want to have to think about where their colleagues are, physically, in order to locate and communicate with them.

On the back end, IT managers want open, standards-based technology that enables integration among a variety of communications clients. They need robust management and performance capabilities, so they can be sure the network will support their end users' efforts—and which they can access from anywhere. As they deploy IP throughout the organization, they want applications that are designed specifically to take advantage of those new networks. And they need everything to be secure and compliant with company and governmental regulations.

The End User Experience

Most end users are not technologists—all they ask of their technology is that it make their work lives easier. Most end users are also stretched to capacity when it comes to doing their jobs—they don't have time to learn how to use new tools, and they won't use anything that isn't intuitive and productivity enhancing. When it comes to communications, they want to be able to reach the people they need to engage with quickly and easily, share information with the click of a button, and launch video capabilities without worrying about the back-end infrastructure.

To deliver value to all end users, unified communications must address certain key considerations:

- **Any Device, Anywhere.** In today's virtual workplace, employees are no longer chained to their desks—or their desktop PCs. As they move to a virtual and increasingly mobile work environment, end users need to be able to access a single communications interface from any device: a PDA, a cell phone, a hard phone, a laptop, even a video conferencing system. Obviously, all modes of communication don't work equally well on any device—participating in a video conference from a cell phone is often an exercise in frustration. But that's the point: Applications should be flexible and intelligent, so that end users can tap into the right technology regardless of where they are and what device they're using.
- **Text to Voice to Video Communications.** Today's collaboration sessions are often progressive: they start as an IM chat, escalate to a phone call, then turn into a video conference as more people join, or the discussion gets more strategic (or involves visual aides). Unified communications must enable that progression seamlessly and easily, so that participants can change applications with a single click.
- **One to One, to One to Many.** Today's collaboration sessions often progress from a conversation between two people to a meeting of many; as the discussion gets more elaborate, complicated or important, other voices are needed to add information and/or sign off on the result. Just as it should be easy to click from one form of communication

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to another, it should be simple to conference in multiple parties—regardless of where they're located, or what device they're on.

- **The Right Tool at the Right Time.** With unified communications applications, users have access to a complete set of communications tools: voice, e-mail, chat, audio conferencing, web collaboration and video communications. Indeed, this is the fundamental advantage of UC over single-channel communications tools such as the telephone and e-mail: Users can easily select the communications tool that best fits the particular communications task at hand.
- **Presence-Aware Collaboration (Click to Communicate).** Unified communications must tap and share information about the current availability of everyone in a particular community (e.g. buddy list, workgroup, or entire organization). This makes it much easier to arrange spur-of-the-moment discussions. It even simplifies formally scheduling planned meetings, since the organizer can quickly rule in or rule out potential times by messaging participants online. (Without shared presence information scheduling a thirty minute meeting of five busy colleagues can take several days.) Using presence information, unified communications applications allow knowledge workers to initiate communication with another person with a single mouse click, then change the mode of communication (from, say, a voice call to a video session), also with a single click.
- **Easy to Launch, Easy to Use.** There is a fundamental design principle for unified communications solutions: It must be easy and intuitive for the user to navigate through the system, launch a conversation, collaboration session or video conference, and switch among channels as needed. Today's UC and video conferencing technologies offer extremely good picture and sound quality, and they're so simple to use, employees can launch voice and video calls on the fly, making it much more likely they'll take advantage of the tools more often, thereby reaping more cost-savings and performance gains.

Infrastructure Requirements & Best Practices

Different organizations will have different infrastructure requirements, of course. In certain markets, such as health care and financial services, strict regulations around privacy and record retention may affect how communications systems are deployed. In others, such as law enforcement or entertainment, communications may require the extremely high resolution and the immersive nature of a very high-end telepresence system. But certain key factors are critical to all successful implementations:

- **Network & Endpoints.** As companies move to deploy intelligent UC applications, they should aim to do so on an IP network that can accommodate a variety of endpoints and applications. After all, the number of endpoint options is seemingly limitless, and includes everything from PCs to cell phones and PDAs, room-based video conferencing systems to executive desktop models, soft phones to IM clients. Employees don't want to have to think about what endpoints they're using, let alone which ones their colleagues are

on; nor should IT. Instead, companies should design and build their networks to support as wide a range of devices and applications as possible, for today and for tomorrow.

- **Open Integration (SIP, Standards and Future-Proofing).** Standards are critical for several reasons: They help the customer avoid becoming locked into a single vendor; they make it easier for one organization to establish rich communications with another organization that might be using a different vendor's gear; and they provide a path for future expansion and enhancement of the system's capabilities. SIP is the dominant standard for UC solutions in general, and video-enabled UC solutions in particular, because it supports new-application creation and enables out-of-the box integration. SIP is also driving vendors to provide greater value to business customers by offering tools that let them customize applications and integrate with the vendors' platforms. With SIP, users have a single identity that travels with them and seamlessly connects to the appropriate communication tool, whether it be a video endpoint, PC application or mobile device. SIP is also optimized for IP, making SIP-based solutions especially attractive to IT managers looking for ways to leverage the company's IP network. Still, SIP has evolved slowly, and multiple SIP versions and at least a few proprietary hooks exist in most SIP-based products today. For truly "instant" integration, IT managers must look for products that are built from 100% SIP technology.
- **Easy to Manage.** Any UC and video conferencing solution deployed today must be user-driven and user-directed, so that IT doesn't have to launch or manage ongoing communications. A significant drawback to earlier video conferencing systems was that end users had to call in the IT staff in order to launch a meeting; no one will stand for that today, on either side of the equation. IT simply has too many other priorities, and end users expect to have complete control and management over their communications. Still, every vendor will claim to excel here, and validating their claims is critical. Organizations exploring video-enabled UC should "test drive" the technology to determine how well each system matches their own management needs, policies and expectations.
- **Quality of Service, Managed Bandwidth.** In its early days, enterprises avoided voice over IP for one simple reason: Managers worried that call quality wasn't on par with that of traditional voice systems. That concern has largely disappeared, thanks to pilot programs that have proven out the value of VoIP. Still, to be successful among users and decision makers alike, any VoIP system must deliver quality that matches or exceeds its POTS counterpart—and IT must use management tools to guarantee that quality of service. Similarly, although today's high definition video conferencing solutions offer remarkable quality, even a high-resolution image and greater frame rate will fail if the network introduces jitter and lag (or collapses completely). Any effective video-enabled UC system must be based upon network quality of service, and that QoS must take bandwidth—and bandwidth variations—into account. In the virtual workplace, the network *is* your business.

- **Successfully Integrating HD Video Conferencing.** One of the biggest attributes of a video-enabled UC solution is that it's not a special-purpose tool, but rather just another communications channel available at the click of a button. Most unified communications applications include PC-based video conferencing, which allow users to click to escalate a voice call or web collaboration session into a video conference on their PCs. But many organizations have also invested significant amounts in other forms of video conferencing—including executive and room-based systems—and they intend to invest even more in the months and years to come. Those older systems, as well as new technologies such as high definition video and telepresence, must be integrated into any unified communications deployment, so that users can communicate with one another over the best channel for the job at hand. That means UC users should be able to access data about video conferencing systems available to them and their colleagues, then use location-based presence information for both rooms and participants to schedule planned or ad-hoc visual collaboration sessions. That way, multiple participants can call into a meeting from multiple endpoints: one from a PC, another from a conference room, and a third from a home office via an executive desktop system, for instance.

CONCLUSION

IP networks, voice over IP, unified communications, high definition video, and standards such as Session Initiation Protocol are changing the way companies and their employees communicate. In today's 24/7, virtual world, there is no “best” form of communications—but the time is right for voice, video and UC to come together. Depending on the task at hand or people involved, any of several established or emerging endpoints and applications may fit best.

Smart IT teams will adopt a SIP-based unified communications strategy to make it easy for employees to choose and use the best communications tool for any given interaction. That way, members of a single team can seamlessly collaborate using voice, video and other forms of unified communications based on where they're located and what they're doing at the time—rather than on what tools they've been given access to by their organization. They can also move from a voice call to a video conference, then add web collaboration on the fly, all as requirements dictate and their devices allow.

As companies deploy these next-generation technologies, however, they must pay close attention to end-user needs and IT priorities. Ease of use, manageability, performance and interoperability are all key to success. If they get it right, companies can reap significant benefits, including lower costs, higher productivity and new revenue opportunities.

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