

## WHITE PAPER

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### VoIP: Delivering the Competitive Advantage

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After years of hype, voice over Internet protocol (VoIP) has made the shift from an emerging technology to a viable business solution. Business VoIP deployments are accelerating because the technology provides a measurable cost savings, simplifies the delivery and management of communications, and facilitates convergence for more flexible business.

Early implementations of enterprise VoIP were somewhat uneven in terms of delivering a quality service that matched or exceeded what was available via legacy services and customer premise equipment (CPE). Next-generation providers, such as Vonage and Skype, have done much to familiarize the general public with VoIP and its capabilities and have shown early success by offering cheap and, in some cases, free calling services. Utilizing VoIP technology to consistently deliver reliable, secure, feature-rich, and high-quality voice on a consistent basis is a much more daunting proposition. Vendors and carriers have brought VoIP to new levels of quality and reliability that can match or exceed those of traditional time-division multiplexing (TDM) technologies. In addition, the technology behind VoIP has proven that it can deliver more than just voice. Communications has broken out of its preordained silos, unleashing applications that can integrate communications across the enterprise and providing a truly competitive advantage at price points that are compelling to small and medium-sized businesses (SMBs).

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### Enterprise VoIP: Many Solutions, Infinite Flexibility

Although IP-enabled voice brings many advantages to customers, flexibility is an important attribute that allows the technology to bend to the needs of the user, unlike legacy TDM technology, which forces customers to make choices. Options include:

- ☒ **Premise-based IP PBX.** In the traditional customer premise-based approach, the enterprise owns and manages an IP PBX. Along with the initial purchase of the IP PBX, the enterprise customer typically signs a maintenance contract directly with an equipment vendor or with a value-added reseller (VAR).
- ☒ **Managed IP PBX.** The enterprise owns or leases the equipment but outsources the day-to-day operation, monitoring, and management of the IP PBX and the underlying corporate IP network.

- ☒ **Hosted IP.** Often referred to by the generic designation, "IP Centrex," hosted voice services are an alternative to premise-based business telephone systems and offer much more than the "IP Centrex" reference implies. Hosted IP voice services deliver all business-class telephony features, including an auto attendant, four-digit extension dialing, three-way conferencing, conference bridge, call transfer, call hold, call park, do not disturb, business-class voicemail, and hunt groups. The service supports standard business lines, direct inward dial (DID) lines, and toll-free numbers without requiring changes to existing numbers. Service is delivered on a simple "per-seat, per-month" cost basis, and up-front costs are a fraction of those for traditional PBX equipment. Hosted IP voice services go beyond PBX feature emulation to deliver services that cannot be provided on a PBX.
- ☒ **Collocated IP PBX.** This approach adds another configuration for enabling VoIP in the enterprise. In this scenario, the IP PBX is owned or leased by the corporation but collocated at a secure offsite location that is owned and operated by a third party. In addition to providing a stable and friendly environment for a corporate IP PBX, a collocated offer would also include many, or all, of the services described above.
- ☒ **Peer-to-peer.** Perhaps the most radical approach to deploying VoIP in the enterprise is the so-called peer-to-peer, or P2P, approach. Mirroring Skype's approach to telephony, an enterprise P2P system utilizes a preloaded client embedded in an IP phone or other endpoint to create a network of intelligent nodes. A P2P system does not rely upon a centralized switch, thus enabling small seasonal organizations to set up phone systems without the up-front cost of a PBX or the service commitment of a traditional Centrex contract.

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## **VoIP and the Small Business Customer**

Small and medium-sized enterprises range from single-site companies with 5–10 employees to multiple branch regional businesses that can employ 500 or more workers. SMB customers have not been served particularly well by IT vendors that have often bypassed smaller customers in favor of larger accounts. Some of this bias is simply a product of the cost of technology. Simply put, many SMBs have not been able to afford the capabilities that advanced technology can bring to their business. With competition from increasingly larger multinational corporations, SMBs are under increasing pressure from their customers to match the capabilities of larger organizations with more resources. The added features and flexibility and cost-efficiencies offered by an IP-based telephony system can help SMBs bring some semblance of equality to the playing field.

### ***Cost Reductions: Savings Through Investments in Technology***

Not surprisingly, cost continues to be the most important driver in adopting VoIP for both large enterprises and SMBs. When asked what factors are most important in evaluating IP-based phone systems, 63.4% of business respondents surveyed mentioned the need to cut costs as the primary reason when upgrading to a VoIP service. Overall, IDC estimates that a VoIP system can reduce telephony-related expenses by 30%.

Still, achieving recognizable savings is not "plug and play" and requires preparation and investment by the business customer. To attain the maximum cost savings from VoIP, customers must first converge both voice and data traffic onto a single corporate LAN optimized for voice. The operational cost savings realized from operating a single converged network can be significant, and in many cases, these savings alone have justified the deployment of enterprise VoIP. Of course, how quickly the cost benefits are realized will depend upon the overall condition of the enterprise LAN. Voice does not require large amounts of bandwidth; however, it is extremely sensitive to network congestion, and unless the corporate LAN is properly configured, the quality of voice calls can quickly decline when faced with a large spike in data usage.

Provisioning and the day-to-day operational expenses in a traditional TDM telephony system can add up quickly. Savings related to activating a port or moving an extension can be significant and are an important target when reducing costs, as requests for moves, adds, and changes (MACs) to third-party PBX vendors can range from \$100 to \$400 per service call. The average employee moves desks once per year. The cost to move a traditional phone is \$75–135 per change, and changes can take days to complete.

#### ***Customization: Pushing Efficiency and Ease of Use to the Worker***

IDC believes that although VoIP can reduce costs and enable seamless mobility and connectivity, customization is an often overlooked benefit. Customization allows employees to create simple applications that can help make day-to-day tasks less time-consuming and stressful. The ability to customize is, of course, dependent upon the use of standards-based software and easy-to-use interfaces. By utilizing XML, in-house staff can test and develop a new feature in weeks. In addition, because XML is used extensively in designing Web sites, carriers can also leverage a huge outsourced talent base when developing new applications. This is particularly important for smaller businesses that typically do not have a development staff but often need specialized telephony applications that match their particular vertical. For example, a small business owner who operates a chain of carwashes could hire an outside developer to help prioritize the maintenance staff by automatically routing calls to the closest staff member while sending a text message describing the nature of the problem. This has huge implications in terms of allowing businesses of any size to develop vertically focused customized applications that help increase the value of their VoIP deployment.

#### ***VoIP: The Best Is Yet to Come***

Making the wrong technology choice can choke the life out of a small business, while delaying improvements can hand competitors an advantage. Choosing to migrate to a VoIP solution will deliver cost savings and productivity gains, but it is also a savvy way to prepare a company for future advancements in communications services and applications. In interviews with business owners, we found that the decision to migrate to IP telephony was based on cost reduction, improvements in productivity, and the need to prepare their network for next-generation applications and features. However, in interviews with SMB customers, we found that mobility has emerged as a key tool in doing business and fending off the competition.

Businesses need and are beginning to demand applications that can be accessed anywhere via any device. Utilizing IP-based platforms will be the key enabler of this vision. The ability to stay in touch and transact business while on the road is a necessary capability across all businesses large and small. Today's competitive environment requires businesses to respond to opportunities in minutes, not days. In particular, the "shelf life" of a sales lead has become shorter and shorter, as potential customers are themselves under time pressure. Traditional phone systems are simply unable to deliver crucial information on a timely basis beyond the corporate voicemail system, leaving business travelers uninformed. A VoIP system can effectively break down silos by integrating applications and technologies, resulting in the delivery of important communications in seconds rather than hours.

Although mobile phones are used extensively today by small businesses, the experience is simply a replication of the service silos that have plagued enterprise telephony since before the first PBX was installed. However, while mobility has become a "must-have" capability, the costs associated with wireless services have become the latest drain on enterprise profitability. Although VoIP is most often associated with wireline telephony, the ability to use IP to reduce costs and increase worker productivity is equally applicable in the wireless world.

For instance, a member of the sales staff will be able to utilize four-digit dialing while traveling and will also be able to initiate conference calls without leaving the corporate network, thus reducing toll charges and avoiding costly overages. This transaction could take place on a cell phone but could also take place on a laptop connected to the network via a WiFi connection using a soft phone client. Furthermore, adding the capability to understand who is available to participate in the conference call can help companies avoid scheduling conflicts as well as respond to emergencies quickly and effectively. Finally, the capability to seamlessly roam from a cellular network to a WiFi network adds both flexibility and additional savings, as the ability to push expensive cellular minutes onto a WiFi network via VoIP will help businesses control their mobility costs and increase the value and utility of their converged network.

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## **Applications: Convergence and Efficiency**

While lower cost is necessary to justify the investment and upgrade to VoIP, the availability of advanced features will help sustain that value over time. VoIP is about more than replacing wireline legacy services and equipment. Enabling seamless connectivity through a multitude of devices will create efficiencies as well as drive new business opportunities. However, without acknowledging the needs of the customer, such as seamless connectivity, VoIP will simply yield meaningless concepts. For the SMB owner, the need to work efficiently and cost-effectively trumps all other considerations, and any applications delivered via a VoIP platform that do not conform to these parameters are simply frivolous. Finally, applications that are simple and easy to use are paramount, and IP-based applications can help reduce complexity and amplify ease of use, making it the ideal technology for the SMB customer.

### ***Applications: Getting the Job Done***

Although some IP-based applications are brand new, much of what is being implemented today has been available for some time. A few years ago, the underlying infrastructure and technology were not quite ready for prime time. Additionally, the applications and products were offered to a market that had no use for the conveniences offered. However, much has changed since earlier iterations of VoIP technology and applications were brought to market. With increasing reliance on the Web, along with related tools such as instant messaging (IM), applications that can help and manage the flood of communications and information have become a necessity. In assessing the needs of SMBs, IDC recognizes the following applications as critical in helping these businesses compete and succeed in the competitive marketplace:

- ☒ **Web-based call management.** Users can easily configure and optimize their own calling features via a Web portal, which can be accessed via any Internet connection. Administrative accounts on the call management portal allow office managers to set up default feature sets for different classes of users. The portal contains a call log that displays a list of dialed, received, and missed calls and provides the ability to click to call from the call log or from a directory.
  
- ☒ **Find me/follow me.** Using a Web portal, users can instruct the service to forward their calls to any combination of phone numbers (home phone, cell phone, office phone, or friend's or colleague's phone). This ensures the reception of important calls and avoids the distraction of low-priority calls. Calls can be directed sequentially (e.g., ring office, then mobile, then home) or simultaneously.
  
- ☒ **Remote user.** Calls for specific employees or all employees can quickly be rerouted to satellite offices or home offices, as if they were still receiving and making calls on their normal office extension. This means employees can work from anywhere (e.g., remote offices, home, hotels, executive suites) in a transparent manner. This saves money because it eliminates the need for telephone expense reporting, as all remote calls are made on the company calling plan. The remote user function is an effective disaster recovery solution in the event that power failure or other events knock out the office location. This capability extends to hot desking (one or more employees sharing a predefined workspace). Float staff and employees who typically work at different locations can move between different points on the network without having to alter their telephone extension while retaining full access to their configuration profile. They can do this by moving their phone from one location to another, and they can also log in at a remote location on another telephone set.

- ☒ **Visual voicemail.** A feature that has become quite popular with enterprise customers that have deployed VoIP is visual voicemail. This application allows users to listen to voice messages through a browser or email, as well as through a telephone. This allows voicemail to be handled like email, in that voice messages can be viewed and listened to in priority order according to caller ID or a date/time stamp. Voice messages can be forwarded to any email box. To hear voicemail messages, employees simply "point and click" with their mouse. Voicemail messages can be forwarded as email attachments or stored for reference. Of course, end users can still access their voice messages in the traditional manner by picking up their desktop handset or dialing in from a remote phone. The displayed messages are not only voicemail but also email, thus enabling an employee to see all of his or her messages in one view. This creates a unified mailbox of voicemail, email, and faxes and enables a centralized directory with click-to-call and click-to-conference functions. The ability to view an entire message store from any device becomes an extremely powerful tool to employees with busy travel schedules.
  
- ☒ **Presence.** Applications such as presence, which are similar to "find me" and "follow me" applications, allow employees to discern the availability of other employees to engage in a communications session. At the most basic level, IM clients on PCs exemplify the power of presence, whereby IM users can see who is online and available to chat. Taken a step further, IP telephony transfers presence into a robust tool that can help employees get the most out of their day. Because workers are able to advertise their availability to communication, whether it be wireline/wireless, voice, IM, video, or conference call, they spend less time planning how and when they are available to communicate and more time actually communicating.
  
- ☒ **Disaster response.** The ability to reroute communications during a natural disaster has typically been limited to multinational corporations that have the budget to build alternative circuits to reroute their traffic. However, the flexibility built into IP-based voice allows small businesses access to the same disaster response capabilities as large corporations. Although the recovery process can take months, the SMB owner can reroute calls to an alternative location and be ready to open for business soon after a disastrous event.
  
- ☒ **Communities of interest.** Perhaps less of an application and more of an opportunity, VoIP can help promote relationships within the small business community that are economically beneficial to all parties. Although one of the key drivers of VoIP deployment is cost reduction, the opportunity to increase savings through private peering relations looms large. From a public network perspective, what begins as a VoIP call rarely stays a VoIP call — at some point, the call touches the traditional phone network. Of course, touching the traditional phone network adds cost, which is eventually billed back to the end user by the carrier. In an attempt to avoid the costs associated with traversing the traditional phone network, businesses are beginning to set up private peering relationships that enable end-to-end IP calling. These peering relations are generally done via connections provided by a third-party ISP, but they enable smaller business to further leverage the value of their VoIP platform. Thus, select groups of small businesses can band together to keep communications costs as low as possible.

## VoIP Options: Pros and Cons

### *Making the Choice*

From the very start, IP adds flexibility and choice to any enterprise telephony deployment. However, some flavors of IP telephony may be better suited than others in terms of helping enterprise customers reduce cost and gain efficiencies. Although each enterprise has unique communications needs, the following descriptions will help guide businesses through the process of purchasing a solution that will best serve their needs. It is also important to remember that one solution may not best serve customers' needs; rather, a solution that includes different types of delivery options may work best.

### **IP PBX**

For many business owners, the purchase of an IP PBX directly from a vendor or qualified VAR provides both a level of comfort in terms of control and well-traveled familiarity. Practically all businesses have the processes in place to accommodate the purchase, installation, and operation of a new premise-based solution. This type of arrangement will best benefit an SMB that has the staff and expertise to run an IP-based box and fine-tune its network to accommodate a converged voice/data network. However, it is important to realize that the true savings and efficiencies embedded in deploying an IP solution can be maximized only if the entire organization switches to a standardized vendor and network architecture.

- ☒ **Pros.** Like most enterprise VoIP deployments, IP PBX deployments can help an enterprise realize reductions in MACs and access expense. In addition, if the enterprise consists of multiple locations in different geographies, there will most certainly be a savings on toll charges. Any customized applications that are linked to the enterprise voice system can be updated to take advantage of IP.
- ☒ **Cons.** Installing and operating a converged network are not "plug-and-play" propositions. Very few SMB organizations have the in-house expertise to completely manage and operate a VoIP deployment by themselves. Upgrading to VoIP will expose the enterprise voice system to all of the problems associated with data, including viruses and spam. In addition, networks are hardly static in nature, and changes in terms of new employees, equipment, and applications will add to the workload and expense of IT staffs as they attempt to troubleshoot problems.

### **Hosted IP Voice**

This permutation of VoIP delivers all of the business-class telephony features without the up-front costs of purchasing a premise-based system. The service supports standard business lines, DID lines, and toll-free numbers without requiring any changes to existing numbers. Service is delivered on a simple "per-seat, per-month" cost basis, and up-front costs are a fraction of those for traditional PBX equipment. In many cases, hosted IP voice services go beyond PBX feature emulation to deliver services that cannot be offered on a PBX.

- ☒ **Pros.** This type of service is ideal for companies that want to avoid the large capital expenditures and ongoing maintenance costs associated with the purchase of a PBX. In addition, a hosted model has a potentially unlimited life cycle, thus freeing customers from a seven- to eight-year replacement cycle that can be disruptive and take time away from core business functions. Finally, the carrier bears the burden of keeping the service secure and making sure that customers have access to the latest features.
- ☒ **Cons.** Given the difficulty of adding customized features to a carrier-based solution, businesses that are dependent upon highly specialized applications might be better off with a premise-based telephony offering.

### **Collocated IP PBX**

This type of service is best suited for larger enterprise customers that want to maintain control of their voice infrastructure but would like to remove the burden that is associated with onsite deployment. In addition, the IP PBX can be positioned and centralized to serve all of the remote and branch offices, eliminating "islands" and offering standardized feature sets to the entire corporation. In addition, this centralized approach represents significant cost savings by eliminating redundant deployments and their associated service contracts.

- ☒ **Pros.** This type of service reduces the onsite costs associated with maintaining a large piece of equipment, including:
  - ☐ Environmental expense including cooling and "clean power" supply and backup
  - ☐ Transfer of lost real estate from PBX room to more business-oriented purposes
  - ☐ Security
  - ☐ Preservation of the ability to utilize and develop specialized applications that are dependent upon the PBX
  - ☐ Ability to maintain tighter control over voice network than with hosted model
- ☒ **Cons.** The customer is still required to purchase equipment and absorb the operational expenses. In addition, the enterprise still bears the burden of keeping the PBX technically relevant during the depreciation.

### **Managed IP PBX**

Although the option to completely outsource through services such as IP Centrex is available, many companies will prefer to maintain some control over their CPE. In a managed IP PBX service scenario, the customer owns the PBX but contracts with an outside party such as a telecommunications service provider to manage and monitor the PBX from a remote location. IDC believes that this type of solution is attractive to larger SMBs that are looking to outsource some of the responsibilities of their IT staffs.

☒ **Pros.** Customers get the best of both worlds: They can maintain close control over their IP PBX while leaving the complexity of the IP PBX administration, security, and quality of service (QoS) to a qualified service provider. The ability to assign IT staff to more critical areas, including customer support and applications development, is also a benefit.

☒ **Cons.** Capital expenditure is high; plus, monthly service fees can be problematic for cost-sensitive companies. Also, with little need for day-to-day operational oversight, the institutional knowledge gained from years of experience will disappear, making it difficult for the customer to return to a self-reliant CPE approach.

#### **Peer-to-Peer**

This "lightweight" implementation is suitable for very small businesses whose staffs operate on a seasonal basis.

☒ **Pros.** This service is extremely cost-effective from an equipment perspective and simple to implement.

☒ **Cons.** Enterprise peer-to-peer technology is very green, and much is unknown regarding how these systems perform under real network conditions.

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### **NEC: Bringing the Value of VoIP to SMBs**

Although VoIP promises to reduce complexity and cost by converging data and voice onto a single network, making the transition from a legacy proprietary-based system to VoIP is neither easy nor simple. There is much talk about voice as "just another application that rides over an IP environment," but in reality, voice is the most critical service that small business customers simply cannot do without. IP is very much a "different language," and small business owners rarely have the time to become experts. To enable the level of reliability and quality that voice requires takes both experience and technical understanding of voice in a converged environment. NEC has extensive experience in designing, installing, and implementing enterprise communications systems around the world. Furthermore, NEC can forge the necessary relationships needed to support small businesses as they determine the best use of VoIP in their organizations. NEC provides a full range of products and services to ensure IP success, including:

☒ **IP telephony solutions.** NEC's UNIVERGE® SV7000 Multiple-Purpose System (MPS) is a pure-IP telephony solution that addresses the needs of customers that want a server-based product in the 50–500 IP client SMB segment. The UNIVERGE SV7000 MPS is designed to deliver the IP experience by providing the ability to combine converged architecture applications, such as unified communications, presence, collaboration, and soft phones, in addition to delivering standard telephony features.

☒ **Professional services.** NEC can help mitigate the operational issues surrounding VoIP by offering the following:

- ☐ Onsite maintenance with various levels of response time, including same day, next business day, or 24 x 7 same day
- ☐ Proactive performance management and fault resolution
- ☐ Multiapplication support
- ☐ 24 x 7 help desk
- ☐ Single point of contact

☒ **IP assessments.** To help customers get the optimal value from a VoIP deployment, NEC offers several predeployment assessment services, from a simple, inexpensive "pass/fail" assessment called IP Redicheck to a full-blown IP telephony assessment that identifies specific problems and makes recommendations for resolution. These services enable businesses to avoid costly postdeployment problems by identifying potential bottlenecks and throughput issues before implementation. These assessments are completed through proven methodologies that analyze the network from a number of different perspectives:

- ☐ A detailed inventory of the customer's current IT infrastructure including routers and switches as well as a review of the enterprise computing capabilities to ascertain network readiness.
- ☐ A test of the current network's performance to determine link utilization and protocol distribution/utilization, which provides a point of reference to work from during the deployment cycle.
- ☐ Network "stress testing" is also performed using anticipated levels of traffic with a variety of codecs. Measurement and analysis of QoS take into account jitter, delay, and packet loss.

☒ **Managed services.** NEC offers NEC Secure, a complete managed services suite for both enterprise and SMB markets. The NEC Secure family includes:

- ☐ **NEC Secure Message Protection Suite.** This suite helps preserve the productivity and benefits of email communications by offering users a comprehensive, end-to-end approach to message compliance, security, and continuity.
- ☐ **NEC Secure Advantage.** NEC extends its monitoring and Technical Assistance Center (TAC) support by assigning an engineer to provide remote or onsite management.
- ☐ **NEC Secure Remote Monitoring and Management.** NEC provides 24 x 7 device monitoring and remote management services on network-attached devices such as routers, telephony switches, and servers.
- ☐ **NEC Secure Threat Management Services.** NEC provides 24 x 7 security monitoring in real time, delivered via a Web-based portal.

NEC's solutions and services help ensure that customers' networks are available even during disaster and emergency situations. By providing network device and traffic monitoring services, NEC helps SMBs increase overall network availability and helps combat security breaches, which constitute the most pressing issues facing VoIP users today. Although this level of protection may not be suitable for all SMBs, businesses that are in the healthcare and finance verticals are especially vulnerable and may utilize these services to help avoid lawsuits related to lapses in security. The versatility of NEC's products and services provides the flexibility to help SMBs incorporate advanced communications solutions to drive productivity and collaboration while lowering costs. This versatility, coupled with NEC's strategy to offer SMB customers the freedom to adopt VoIP — when and where they need it — strongly positions NEC in the SMB market, enabling the company to help this targeted segment meet changing communications demands.

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