Leveraging Voice Over IP
for Tangible Business Results

from GlobalPhone Corporation

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For most organizations in business today, a phone system is both an asset as well as a liability. The majority of companies rely on their phone system for mission critical operations as a lifeline to communicate between their employees and with their customers. But all too often, the cost of maintaining a business phone system results in unnecessary expense that has a direct impact on the bottom line.

Over the past few years, it has become increasingly more important for businesses to leverage technology to run efficiently and cost effectively. One such enabling technology is Voice Over Internet Protocol (VOIP), also called Internet Telephony, which changes telephone calls into data that is transmitted over a corporate data network and externally over the Internet. This technological advancement can offer your enterprise a more cost-effective business phone system and a host of new productivity improvements for your company.

The History of VOIP

Although VOIP has been around for years, it is only recently that the technology has matured to the point where it can carry high quality business communications. The earliest implementations of VOIP used PC-based solutions that were unreliable and poor quality. While users could get "free" calls across the Internet, the service was not robust enough to connect to the public switched telephone network, and certainly not reliable enough for business use.

Several key improvements have emerged during the past couple of years making VOIP technologies ready for prime time. The first of these improvements has been the proliferation of IP networks and broadband access throughout the world, and the reliability of Internet infrastructure. In addition, VOIP network infrastructure and sophisticated IP phones can now support Quality of Service (QOS) to ensure that data packets carrying voice calls are routed with high priority in the network so that a telephone call is delivered clearly, reliably and without distortion.

Finally, VOIP-enabling protocols have also matured. The oldest and most basic packet voice protocol is H.323, which has been in use for almost a decade. Later improvements include a proprietary standard developed by Cisco Systems called Skinny Client Control Protocol (SCCP), and Media Gateway Control Protocol (MGCP), which have taken steps to improve the QOS signaling controls. Most recently, the VOIP industry is converging on Session Initiation Protocol (SIP), a simplified protocol that is more compatible with the Internet. With the majority of equipment providers moving to embrace SIP, at long last users need not concern themselves with protocol details, knowing instead that the world is moving toward a single VOIP protocol standard.

Most importantly, however, the cost savings of VOIP have become so significant that many users can no longer ignore it.

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An Economic Decision

Most telecom service providers and hardware vendors agree that all telephony networks will eventually use VOIP technology. For service providers who offer both voice and data services, it is a cost-effective decision to migrate traffic onto a single data network, managing voice communications as just another data application. Instead of operating two separate networks – each with its own costly equipment – service providers can merge all services onto a single data network, eliminating huge costs and passing on savings to customers. However, since many of the largest service providers have billions of dollars of legacy telephone equipment, it may take them years to fully transform their networks to IP. This situation provides opportunities for smaller, more nimble providers to service their customers with leading-edge VOIP-based solutions.

In the consumer market, many residential users are beginning to adopt VOIP technologies that carry voice and data over a single broadband connection. Instead of paying for two or three connections coming into their home, many users would rather consolidate services over a single broadband pipe. Services like Vonage, AT&T's CallVantage, and Verizon's VoiceWing are all touting their ability to offer customers unlimited local and long distance calling for one low monthly rate. While VOIP is still in its infancy with less than 1% penetration, 2004 has seen these companies make a heavy marketing push for consumer-based services. It remains to be seen how quickly these services will catch on with less technology-savvy consumers.

Business users have perhaps the most to gain from moving to VOIP technologies, yet this market has seen the least movement. This is due in part to the fact that business service is a moneymaker for traditional telecom service providers, and carriers are in no hurry to cannibalize their own revenues. In addition, since business users are most sensitive to quality of service and high reliability, some businesses have been hesitant to adopt the new technologies for fear of service interruption. But, with the maturing of VOIP protocols and QOS controls, this could finally be the time for the business community to make this change.

Comparing Total Cost of Ownership

The best indicator for measuring the overall economics of any business investment, such as a new business telephone system, is to look at the total cost of ownership (TCO). TCO measures both the upfront capital expenditures (CapEx) and the ongoing operating expenses (OpEx) required to maintain the equipment throughout its lifetime. Unfortunately these OpEx figures often get overlooked. More often than not, however, it is the OpEx that determines whether or not an investment has made a positive or negative return. When analyzing any new technology, a company's TCO analysis should also factor in productivity improvements delivered by the enabling technology. And most importantly, because TCO measures costs over the full lifespan of the technology, TCO analysis should use a discounted cash flow methodology to factor in the time value of money.

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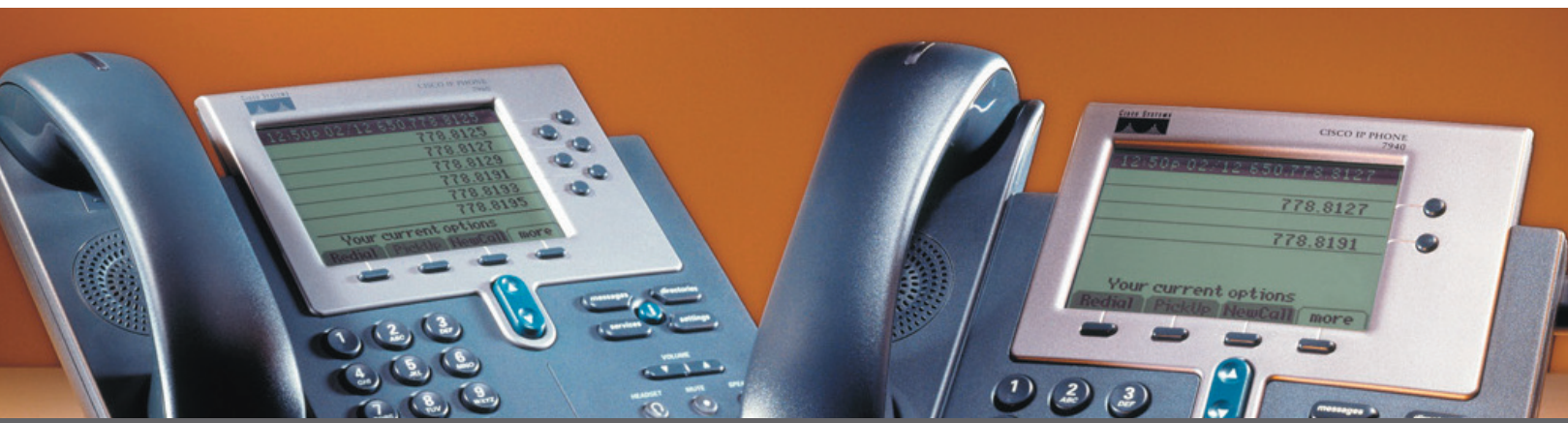
> *"Hosted IP voice services (also known as IP Centrex) offer companies a way to combine the centralization and simplified management aspects of a virtual PBX, with the technical and cost-saving advantages of VOIP"*

Total Cost of Ownership (TCO) Comparisons
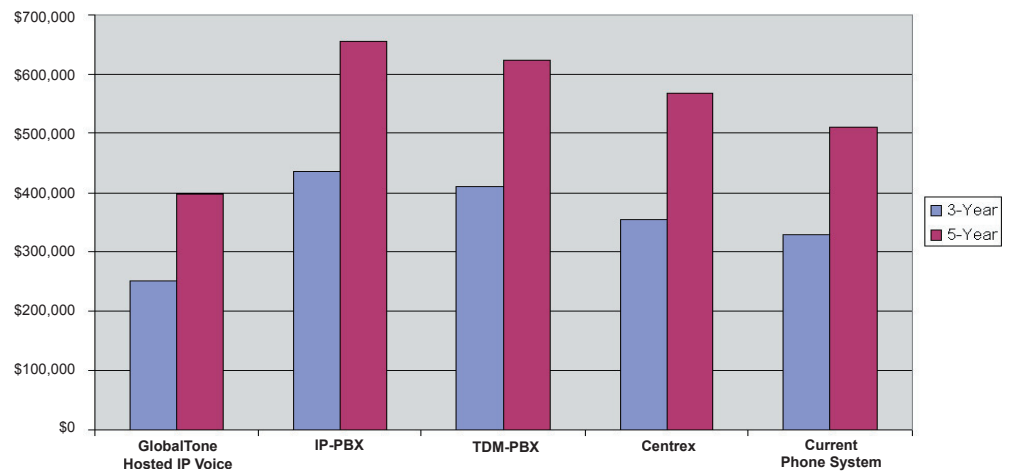
By considering all three components of TCO when evaluating alternative phone solutions, you can ensure an "apples to apples" comparison. In all cases, a robust CapEx analysis should include both initial capital expenditures as well as upgrade costs during the later years. Typical CapEx items in this analysis include:

- Initial system hardware, such as equipment chassis, line cards, and telephone sets
- Racking and connectivity hardware such as wiring, termination, and cross-connects
- Power and HVAC systems required for reliable operation
- Initial software licensing or right-to-use charges
- Hardware upgrades such as expansion modules and additional telephones
- Additional connectivity and ancillary equipment for office expansion or satellite locations
- Software upgrades

When considering a full analysis of OpEx, it is important to include the following expenses:

- Monthly local and long distance charges
- PBX analog or digital trunk charges
- Monthly leased lines between sites
- Annual maintenance contracts
- System upgrade charges for moves, adds and changes
- Loaded labor rate for telecom maintenance staff
- Power, HVAC, and space charges
- Ancillary services such as conference calling, web conferencing, fax lines, etc.

In addition to CapEx and OpEx, a robust TCO analysis should assess increased employee productivity brought about by the new phone solution. Most economists acknowledge that productivity improvements are the single biggest factor for technology-related economic expansion. Have

"Typical business solutions...all fail to take advantage of the convergence of voice and data enabled by VOIP technology"

these improvements enabled your employees to focus on revenue generating or cost-saving activities leading to a positive impact on your company's bottom line? An improved phone system may include the following features that could help your company improve productivity:

- Remote environment, to support initiatives such as telecommuting and office hoteling
- Unified messaging which provides single access to voice mails, faxes, and emails
- Find me / follow me features which enable single number access for individual users
- Web-based integration with contact manager software which provide "click-to-talk" access solutions

Typical Business Solutions

Most business phone systems fall into one of four categories – analog lines, key systems, private branch exchanges (PBXs), or Centrex services based on time division multiplexing (TDM) technology. Analog lines are typically used by very small companies who have just a few lines within an office. Key systems provide additional functionality by allowing up to a few dozen phones to share several analog lines, while providing some additional features such as station-to-station dialing, voice mail, and conference calling. Larger scale offices typically opt for PBX systems, which utilize analog or digital trunking between the company and the local service provider, and can accommodate companies with thousands of users. Centrex is essentially a "virtual PBX" system that allows a company to lease lines and phones directly from their local service provider, while receiving many of the benefits of having a PBX, without the hassle of owning and maintaining any PBX equipment.

While each of these services offers its own pros and cons, they all fail to take advantage of the convergence of voice and data enabled by VOIP technology. As a result, companies that utilize traditional business telecom systems must still maintain two different networks – one for voice and one for data. Typically that requires separate trunks for Internet and voice, not to mention leased lines between remote offices. This is the very scenario that today's communications service providers are migrating from as they build and manage their own next generation networks.

In addition to traditional TDM systems, the majority of PBX vendors have been offering IP-based PBX solutions for the past several years. While these solutions help businesses save money by routing telephone traffic over a company's internal data network, they still require huge upfront capital expenditures in order to upgrade a TDM PBX or migrate to a new IP PBX altogether. In many instances, IP-based PBX systems may cost several hundred thousand dollars, not to mention the ongoing expenses related to upgrading and maintaining these systems. And because the majority of these IP PBX systems focus on using VOIP over the enterprise data network, many companies do not take advantage of the true cost saving capability of routing long distance calls over the Internet.

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Hosted IP Centrex - The Best of Both Worlds

Hosted IP voice services (also known as IP Centrex) offer companies a way to combine the centralization and simplified management aspects of a virtual PBX, with the technical and cost-saving advantages of VOIP. Hosted IP voice services move the business telephone system out of your office and onto a managed subset of the public Internet, while utilizing quality of service controls brought about by the latest VOIP technology improvements to maintain enterprise-class reliability.

Hosted IP voice services can also dramatically reduce your company's communications costs. By eliminating the need to purchase PBX hardware, hosted IP solutions minimize up-front and ongoing capital expenditures. Hosted IP systems can also significantly reduce annual operating costs by linking numerous remote locations into a single centralized system with a simplified web-based interface to manage moves, adds, and changes. Because there is no system to buy and all hardware and software upgrades are managed by the service provider, there is also a reduced risk of technology obsolescence. Even the phones are upgradeable – by installing a new software image the phone can be updated from MGCP to SIP protocol, or even future SIP improvements that may include new features and services.

One of the most compelling reasons to move to a VOIP service is to take advantage of free local and on-net long distance calling. Since intra-company calling typically represents between 30 and 50% of a company's calls, a hosted IP service with free on-net service can represent thousands in savings just from this feature. Furthermore, since the Internet is not limited by geographical boundaries, VOIP technology can dramatically cut your long distance bill no matter where in the world you are calling.

In addition to cost savings, hosted IP voice services offer numerous new features and productivity improvements that even the latest IP-based PBX systems have trouble matching. Hosted IP voice services offer all of the basic telephony and PBX features such as voice mail, auto-attendant, hunt groups and 4-digit dialing. In addition, hosted IP voice services offer features such as a personal communications manager (PCM) web portal that allows the user manage all aspects of their phone. PCM features may include a detailed call log and contact list, "click-to-dial" capabilities, Microsoft Outlook contact integration, and user-configurable find-me / follow-me service that can forward to any phone number such as your cell phone or home phone. A user can even define custom call treatments based on the incoming number, or time-of-day routing – all at the click of a mouse.

Hosted IP voice services may also offer unified messaging, which allows the user to receive voice-mail, faxes, and email through a single mailbox. Coupled with both web and phone conferencing capabilities, these services enable many of the productivity enhancements that cannot be matched by simple PBX implementation.

Finally, in a post-9/11 era when IT professionals are focused on disaster recovery planning, hosted IP voice services offer an off-site, redundant platform that can easily be reconfigured in the event of catastrophic failure. Because the phone system is housed off-site and is accessible through any active Internet connection, destruction of a company's infrastructure will not impact its phone

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system. A hosted IP system can be reconfigured within minutes to ensure that calls are re-routed to working telephones, such as mobile phones or telephones in other company locations.

Run The Numbers and See For Yourself

There's no doubt that hosted IP voice services have the edge over traditional key systems, PBX systems, and IP PBX solutions from a qualitative standpoint. But quantitatively, how do these options compare? Let's look at some representative numbers to perform the complete TCO analysis:

- CapEx – Since there is no PBX equipment to buy, and no hardware or software upgrades to purchase, this could represent a savings of $10,000 for a small system to upwards of $100,000 for dozens of users with several remote sites. And while IP phones may currently be slightly more expensive than proprietary PBX phones, they also offer a migration path to future technology enhancements. Depending on the VOIP protocol in use, a QOS appliance (similar to a standard IP router) may also be required, but this cost is minimal in comparison to a full PBX, and may not even be required for SIP implementations. Finally, since the service provider hosts the equipment centrally, there is no cost for future hardware or software upgrades.

- OpEx – As discussed earlier, free on-net calling may represent the single most important savings for the average company. And since hosted IP voice services can operate through your existing Internet connection, there is no need for separate telephone trunks or lines to carry your voice calls. Companies can also eliminate leased lines between locations that are dedicated for voice calls. These two items alone can save an average of $7,000-$12,000 annually per T1 line, per location. In addition, with no maintenance contracts or service calls required, simplified administration for moves, adds and changes, and no power or space considerations for housing equipment, companies can save literally thousands of dollars per month.

- Productivity improvements – Quantifying the productivity improvements offered by hosted IP voice services may prove to be more of a challenge. However, when you consider the flexibility offered by these services and the average loaded labor rate of any professional easily reaching $100,000 per year – even a tiny increase in productivity, say 2% to 5%, for each employee can translate into hundreds of thousands of dollars per year.

There are several case studies available that demonstrate the annual cost savings of thousands of dollars over the lifetime of the system. In one case, a hospital in Long Island, NY cut its telecom expenses by more than 40% and saved almost $1 million in its 1000 seat implementation by using a hosted IP voice solution to replace 21 separate PBXs.[1]

In most companies with fewer than 1000 employees, the decision to move to a hosted IP system can lead to annual savings of up to 30% over their existing phone system, and up to 50% when comparing hosted IP voice to a new PBX build. Typical implementations result in full payback in 12-18 months. The best candidates have between 10 and 500 employees, have remote offices, and are striving to embrace technology to give their companies a competitive edge.

[1] *"VoIP: Just what the doctor ordered", Dennis Pappalardo, Network World, September 13, 2004*

About GlobalPhone Corporation

GlobalPhone is a facilities-based carrier providing telecom solutions to 600,000 customers in over 130 countries using its state-of-the-art TDM and Voice Over IP network. GlobalPhone maintains business relationships with many of the world's top carriers, and provides its award-winning GlobalTone^{SM} hosted IP Centrex services through the Level(3) Enabled Partner Program.

GlobalTone^{SM} is a hosted IP voice service with free local and on-net calling, web-based personal communications manager, unified messaging, voice and web conferencing, remote calling and Microsoft Outlook integration. Service packages start as low as $25 per user per month.

For more information or to request your free TCO analysis, please visit us online at www.gphone.com/globaltone.

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