



**Is Hosted Voice-over-IP (VoIP)
Right for Your Business?**

February 2007

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Is Hosted VoIP Right for Your Business?

Introduction to VoIP

Interest in Voice over Internet Protocol (VoIP) is higher than ever. It seems that you can't pick up a major publication (mainstream or trade) or read a telecommunications web blog without seeing the term at least once. "Enterprise VoIP Adoption Soars", screams one headline; "28 Millions Consumers will Switch to VoIP by 2008", says another.

Although interest and awareness of VoIP is soaring, the Small and Medium Business (SMB) market isn't getting the attention that it deserves. Even as the consumer VoIP market moves into the mainstream, very few of the analysts and pundits have focused on what VoIP means to SMBs, how it will affect their bottom line, and how they can evaluate VoIP products and services.

What is VoIP?

Simply put, VoIP is a way of using the same communications protocol to carry voice traffic as the internet does for data traffic.

When you use a browser to access a website, the data is transferred between the website and your browser using Internet Protocol or IP. In IP, the data is broken up into discrete parts called packets. These data packets move across the internet with each packet taking its own route from the website to your browser. Once the packets get to your computer, the browser reassembles them into a web page.

It's as if you and ten of your friends left from work and got into ten different cars to meet up for dinner. Each car might take a slightly different route to get from your office to the restaurant, but once each car got there, your group would reassemble before entering the building.

For decades now, when you placed a telephone call, your voice was carried over the Public Switched Telephone Network (PSTN). The PSTN is fundamentally different from IP because it is *circuit switched*. When you place a call, a dedicated circuit is established between your phone and the phone of the person you are calling. Your voice signal travels across that dedicated circuit continuously until you end the call.

Using the PSTN to make a call is like you and your friends traveling in your cars and driving bumper to bumper along exactly the same route to dinner.

Further, once you start on that route, it is closed to all other traffic and dedicated to your group of cars. Phone companies who own and operate the PSTN typically charge you tolls for using the route, usually for every minute that you spend on the toll road.

VoIP is a way of bypassing the toll by avoiding the PSTN. When you place a call on a VoIP network, your voice is digitized and broken up into "voice packets" that move across the network in a way that's similar to data packets.

If you walked into the server room of most businesses today you would find a data connection (T-1 line, DSL or cable broadband) to carry the "data packets" and a connection to the PSTN to carry voice traffic. If the company was using VoIP, you'd find just one connection because, for VoIP, "voice packets" and "data packets" use the same network.

Internet Phone Calls?

It's often said that VoIP is using the internet to make phone calls. That's not really true especially for VoIP systems that are used for business calls.

The public internet is a chaotic place. Your data packets are moving across the internet along with those of tens of millions of other people. More often than you realize, one of your packets gets lost and never makes it to its final destination. For most routine data traffic like web pages, this is not a huge problem. However, for applications like video or voice, it is big issue.

If voice packets get lost or don't arrive on time, the call quality will suffer and your conversation will sound like a bad cell phone call. For that reason, *business class VoIP calls are carried over a private, managed network that ensures Quality of Service (QoS) for both voice traffic and data traffic.* These private networks connect to the public internet and to the PSTN to ensure that voice and data traffic can reach users who are not part of the private network.

Types of VoIP for Business

For most businesses a telephone system means one or more pieces of equipment, housed at one of your business locations, that connects your business to the PSTN. Often, this equipment is a Private Branch Exchange (PBX) or a Key System.

The PBX provides several services. First, by connecting outside telephone lines or trunks, to the PBX it manages the flow of voice traffic to the PSTN to allow for incoming and outgoing calls. Second, the PBX provides a set of calling features like call

transfer, conference calling, putting calls on hold, etc. Finally, the PBX may have a voice mail system associated with it.

IP PBX

In the VoIP world, many manufacturers now offer IP PBXs. They operate much like standard PBXs except that they carry voice traffic as packets using IP. While IP PBXs offer many of the advantages of VoIP (lower cost calls, more features, etc.) they have some disadvantages.

- **Cost** - Purchasing an IP PBX is a capital expense. The cost varies by size, capacity and manufacturer but it can easily run to tens of thousands of dollars even for a modest size business.
- **Extra Equipment** – The cost of the IP PBX is not likely to be the only up front cost you encounter. Normally you'll end up buying new phones and other networking gear needed to take advantage of all that an IP PBX can offer and ensure call quality.
- **Obsolescence** – Like any other piece of equipment, an IP PBX can quickly become dated. The computer you purchased two years ago might seem slow but you can update it with more memory or a bigger disk. Of course it will cost money to do so and often require the intervention of a technical expert. The same is true for an IP PBX: it can be updated and upgraded, but it will cost money.
- **Management Expenses** – The technology in an IP PBX is sophisticated, operating and managing it requires a specialized skill set. Most SMBs don't have that expertise in house, so many manufacturers offer to manage your IP PBX for you but at additional cost.

Hosted IP PBX

Fortunately, there is a way to get all of the advantages of an IP PBX without many of the drawbacks. It's called Hosted IP PBX.

Hosted IP PBX makes all of the IP PBX features available to a customer while a VoIP service provider owns, hosts, manages and updates the IP PBX equipment. Typically, the service provider will charge the business a small up front fee to start the service and an ongoing monthly fee that includes all voice (local and long distance) and data (internet access) charges.

Hosted IP PBX offers many advantages:

- **No/Low Capital Costs** – With no IP PBX to purchase there is no large capital expenditure needed. Some Hosted IP PBX solutions even let businesses use their existing telephones but some additional equipment is usually needed to ensure call quality.
- **Predictable Operating Expense** – Monthly voice and data charges are usually calculated on a per telephone basis. If you have 50 employees each with a telephone on their desk, your monthly operating cost will be 50 times a set fee. If you add people, you'll know exactly how your costs will increase.
- **No Maintenance Expenses** – Because the VoIP service provider owns the equipment, they are responsible of all the costs associated with equipment and software upgrades.
- **No Management Expenses** – The VoIP service provider is responsible for managing the equipment. Routine changes like adding a new person to the system or changing an extension number are done by the customer using a simple, web interface.

What to Consider When Researching VoIP?

Since 2003, Savatar has been conducting research on the SMB VoIP market. Their findings have become a benchmark for how SMBs view VoIP, how and why they purchase VoIP systems and how service providers are addressing SMB market needs.

As part of their most recent study in Q3 2006, Savatar asked over 500 SMB owners and decision makers how they thought a VoIP system would compare to their current phone system in four areas: cost, system management, migration to a new system and feature availability. Many respondents thought switching to VoIP could provide real cost savings, and that would drive their decision to switch to VoIP. But there was also much confusion regarding management, migration, features, which type of service was right for them, and who they should contact to learn about VoIP.

Despite the confusion, they found a remarkable agreement in two areas: the types of problems SMBs had with their current phone system and why they would switch to VoIP.

The problems most often cited will likely seem familiar to you:

- It's too difficult to make a routine Move/Add/Change (a MAC change) to the phone system.

- The current system lacks features that are critical to business productivity, and it costs too much to add them.
- It is difficult to manage the system across multiple office locations, and it costs too much to expand them.

Again, VoIP, especially Hosted IP PBX provides solutions to these problems.

When asked, “How important are each of the following factors in your decision to switch to a VoIP system: cost, system management, features, age of your current system?”, SMBs were very clear. Ease of System Management and features were important but *over 75% said that lowering cost was the most important factor they would consider when contemplating a switch.*

Comparing the cost of VoIP solutions to each other and to traditional systems is not as easy as comparing the cost of competing long distance plans, for example. A VoIP solution is doing something new; it is replacing and improving the entire existing voice and data infrastructure. Its assessment calls for more than the one-dimensional cost analysis needed to compare long distance plans.

The correct way to evaluate competing systems, both VoIP and traditional, is to calculate and compare the total cost of ownership (TCO) of each solution.

Why Buy VoIP?

The concept of TCO has been used by information technology professionals for a long time to compare the economic consequences to a business of major equipment purchases. They use TCO to sum up all costs – purchase, use, maintenance, one-time, recurring – over a set period of time.

TCO for VoIP

The TCO equation for VoIP systems is simple as shown below:

$$\text{TCO} = (\text{Acquisition Costs}) + (\text{Monthly Recurring Costs}) + (\text{Annual Maintenance Costs})$$

Let’s look at each element separately.

Acquisition Costs

An acquisition cost is any cost that is paid up front. For VoIP, acquisition costs are more than just equipment purchases. They include system installation and employee training. Remember that with VoIP, voice and data are carried over the same

connection so there are usually charges related to the provisioning of that connection.

Simply put, ask your prospective VoIP vendor, “*What do I need to write a check for up front to make a switch to VoIP?*”

For IP PBX, Acquisition Costs will also include the cost of the IP PBX and any other equipment like routers, switches, phones, cabling, power supplies, etc. There will also be costs for shipping, installation, and configuration of the equipment. Sometimes there will also be a purchase cost for software that runs the IP PBX.

Hosted IP PBX has significantly lower Acquisition Costs because there is no IP PBX to purchase and little additional equipment required (usually a small device to ensure Quality of Service). Some Hosted IP PBX systems do require the purchase of new phones.

In both the premises-based and hosted scenarios, most vendors recommend a network assessment to ensure the LAN can handle voice traffic without degrading quality or reliability. The cost for performing that assessment and making recommended changes to the LAN need to be included in the calculation.

Monthly Recurring Costs

With VoIP, Monthly Recurring Costs are for both voice and data and can take several different forms. Some service providers charge per minute usage fees for local and long distance calls along with a fixed monthly cost for data. Others bundle these charges together into a single monthly fee that offer unlimited data access and either a block of voice minutes for shared use by everyone in your company or unlimited voice minutes.

Regardless of how the service provider constructs the charges, ask your prospective VoIP vendor, “*What do I need to write a check for every month for my voice and data service?*”

With most IP PBX solutions, your monthly charges will include a fixed charge for the data circuit. For IP PBX, your voice charges will vary from month to month because calls are charged for on a per minute basis. This means that you’ll need to make some estimates of your voice minute usage for local, long distance and local toll calls and multiply by the per minute charges.

If you have more than one business location, voice charges are waived for calls between your offices

because the calls are never transferred to the PSTN but are carried across the service providers' VoIP network. Calls from one office to another are sometimes referred to as "On Net" calls.

Often, SMBs will purchase an IP PBX as a *managed service offering* which means that the vendor will be responsible of all management and maintenance of the IP PBX and any other equipment that resides in your office. On the plus side, this means that you will not need to train and dedicate staff to system management but, the negative is that there will be monthly management charge to include in the TCO.

With Hosted IP PBX, monthly recurring voice charges are simpler. Normally, the service provider will charge a fixed monthly cost *per telephone set*. This fixed cost includes unlimited local, long distance and local toll calls and all fees related to system management and maintenance. Some Hosted IP PBX vendors even include the cost of the data circuit in the monthly cost per telephone set.

Annual Maintenance Costs

Annual maintenance costs have been a given in hardware or software purchases for years. Companies often charge 10-20 percent of the purchase cost of these products each year to guarantee technical support and product updates. The situation is no different with VoIP.

You will need to ask your VoIP vendor, *"What do I need to write a check for at the end of each contract year for maintenance of my voice and data service?"*

For IP PBX, each vendor handles these costs a bit differently. Some will charge a single fee that is a percentage of the purchase price of the IP PBX. Others will charge a fixed annual fee for each piece of equipment under management. Some offer different levels of support at different fee levels. They may charge one price for telephone-only support during regular business hours, or they may offer a higher price for premium support that includes technicians coming on site within two hours, seven days a week, to fix any problem that arises.

Again, Hosted IP PBX is simpler: there are no Annual Maintenance Costs.

TCO Example for VoIP

Let's take a look at how the options might stack up for a typical SMB. Savatar was recently involved in the purchase of a VoIP solution for an insurance company based in a large metropolitan area on the

east coast. In switching to a new VoIP system, the company wanted to reduce their overall voice and data costs, reduce the number of vendors providing these services, and avoid hiring dedicated staff to manage the new infrastructure.

This 50-employee company was using different providers for local and long distance voice services and a third provider for T1 access to the Internet. They had a ten-year-old PBX that provided basic voice mail and calling features. They did not manage the PBX in house; they contracted with another vendor for this service. Savatar calculated TCO over a three-year period.

Savatar started the buying process by drawing up a short list of 10 vendors and quickly whittled down the list to two vendors based on their responsiveness and product knowledge. Both vendors were very recognizable names in the telecommunications industry. Vendor A offered an IP PBX solution; Vendor B, a Hosted IP PBX solution. Through a series of sales meetings and site visits they began to gather the information necessary to calculate the TCO of their product offerings.

Acquisition Costs

Given the age of the company's old phone system, they decided to replace the telephone sets. This would be the first Acquisition Cost. Each vendor carried similar VoIP telephones from name brands. Vendor A's cost \$279 per phone; Vendor B's, \$312 per phone.

There were other acquisition costs for Vendors A and B.

- Equipment, shipping, installation and configuration costs totaled \$40,518 for Vendor A's IP PBX solution
- A Quality of Service (QoS) device, data router, installation and activation of service, and end user training totaled \$1,284 for Vendor B's Hosted IP PBX solution

Monthly Recurring Costs

The company was required to sign a three year contract to have each vendor provide a data circuit to carry the company's voice and data traffic.

- Vendor A's price was \$600 per month
- Vendor B's price was \$750 per month

Based on the company's voice usage, Vendor A estimated a monthly recurring usage charge of \$168

for the 50 employees. Their calling plan was based on a rate of 2.5 cents per minute for all long distance and toll calls.

Vendor B did not charge for usage. Instead, as is common with Hosted IP PBX, they offered a service contract that charged a fixed fee of \$23.60 per telephone per month to cover the cost of all voice calls and management of the system (\$23.60 doesn't include the feature costs, a total cost per telephone is discussed on the next page).

Since the company did not want to hire or train staff to manage the new system, Savatar asked each vendor for a cost to handle that job. Vendor A offered complete management services for \$1,031 per month. Vendor B's management costs were already built into their service contract price for Hosted IP PBX.

Annual Maintenance Costs

To keep their new IP PBX up to date and have on-site support on call, the company would need to purchase a maintenance contract from Vendor A. The cost was \$2,700 per year.

Vendor B had no annual maintenance charge associated with their Hosted IP PBX solution.

Traditional Voice/Data Service

As a final check, they approached the local phone company to cost out a replacement traditional voice and data service. The phone company recommended a package of Centrex voice service (essentially a hosted traditional PBX), plus T1 dedicated Internet access.

The acquisition costs were very low, \$420 with no new phones required. Monthly recurring costs included \$805 per month for the data circuit, 3.9¢ per minute for all local, long distance and local toll calls, and a charge of \$2,602 per month for the service pack of calling features. Using the same voice minutes per user per month, the total monthly recurring cost of \$4,043 was per month. There were no annual maintenance costs.

TCO Comparison

The table to the right shows the results of the TCO calculation for a three year period.

From a TCO point of view, the answer is clear: **Vendor B's Hosted IP PBX solution has a TCO over 31% less than Vendor A's IP PBX and about 69% less than traditional phone services.**

	Vendor A IP PBX	Vendor B Hosted IP PBX	Traditional Voice/Data Service
Acquisition Costs			
Phones	\$ 13,950	\$ 15,600	-
Equipment	17,208	474	-
Installation, Configuration, Training	9,360	810	420
Subtotal	\$ 40,518	\$ 16,884	\$ 420
Monthly Recurring Costs			
Data Circuit	\$ 21,600	\$ 27,000	\$ 28,960
Usage Charges	6,030	-	22,865
Service Contract	-	42,480	93,665
Management Fee	37,116	-	-
Subtotal	\$ 64,746	\$ 69,480	\$ 145,530
Annual Maintenance Costs			
Maintenance and On Site Support	\$ 8,100	\$ -	-
Subtotal	\$ 8,100	\$ -	-
TCO	\$ 113,364	\$ 86,364	\$ 145,950

It is useful to look at the TCO numbers from a slightly different angle. The numbers on the table above are for a 50-person company over three years, and include all voice and data costs for the company. If we take the TCO number, divide by the number of employees and divide again by the number of months in the contract, we can come up with a total cost for voice and data per employee per month.

In this case, it works out to about **\$62.98/employee/month for the IP PBX, \$81.08 for traditional voice and data service, and \$47.98/employee/month for the Hosted IP PBX.**

In addition to TCO, Hosted IP PBX is superior to traditional voice and data service in two other areas: system management and feature set. The phone company manages all aspects of the traditional voice and data service. This means that even routine changes like moving an extension from one office to another requires a call to the service provider, a cost for making the change and a day or two wait until the provider actually does the move. With Hosted IP PBX, the same move would take about 30 seconds, at no charge, and could be done using a simple web browser application.

Hosted IP PBX also will provide a much far richer feature set. Traditional voice and data service will come with call waiting, caller ID, call transfer, etc. Hosted IP PBX has all of these and many new features that can provide real productivity.

Other Considerations

There are a variety of other factors that augment TCO analysis that should be considered when analyzing VoIP service providers. Some of the most important are VoIP Network Performance, Solution Scalability, and Workforce Productivity Improvements.

VoIP Network Performance

Any VoIP solution is only as reliable as the network that carries your voice and data traffic. As mentioned earlier, services providers who offer business class VoIP services carry voice and data packets over a managed network to ensure service quality.

Any provider offering such a network can and should provide information on the network's performance including security, redundancy, and reliability. When selecting a VoIP service provider, poor network performance is knockout criteria. There is simply no point in working with a vendor who offers a large TCO advantage but has a track record of poor network performance.

Ask your potential service provider, *"How long has your network been carrying converged voice and data traffic?"*

Solution Scalability

There are two dimensions to consider when evaluating the scalability of a VoIP solution: adding users to the system, and adding features to the system.

A VoIP solution with a 30 percent TCO advantage for a 40-person company may not maintain that advantage as the company grows to 70 employees. For IP PBX, you should be especially careful in this respect.

IP PBXs come in many different sizes, often characterized by the number of ports in the equipment. Generally, each port can support one voice/data connection. A 48-port IP PBX can support a voice/data connect for each employee of a 40-person company but is many ports short when the company grows to 70 people. When you exceed the port capacity of the IP PBX, you need to either purchase additional ports or, in the worst case, a larger IP PBX. Obviously, this will affect TCO greatly.

Ask your prospective service provider, *"How will my costs scale as I add new users to the system?"*

When it comes to adding new features, be sure that a prospective vendor can supply them in a cost effective way. It is equally important to know that a vendor has an evolutionary product path in place to ensure an easy transition to a more sophisticated or larger system as an SMB grows.

Ask the prospective service provider, *"What happens when I outgrow this new system? Can your system grow as my business grows?"*

Productivity Improvements

Productivity Improvements are difficult to quantify, especially in SMBs, so we have chosen not to add them into the TCO equation. However, it is worth noting that many VoIP features *can* lead to productivity gains and, at the very least, give VoIP solutions a significant feature advantage over traditional systems.

Some of the more interesting VoIP features include:

- **Personal Mobility** features including selective call routing, simultaneous ring and sequential ringing, to increase productivity and customer service
- **Mobile Extensions** extend hosted IP PBX features to a cell phone making it easy to manage call features from mobile devices
- **Unified messaging** which consolidates voice mail, e-mail, video mail and fax into a single, easy-to-reference interface.
- **Web Portal/Extension Dialing** gives users control and the power to personalize their call features
- **Uniform Dialing Plans** which give remote offices the same features and function as the main office site.

Conclusions

VoIP can bring significant cost savings to Small and Medium Businesses. But, with different types of VoIP sold by many diverse service providers, SMB should evaluate their options carefully before making the switch. The Total Cost of Ownership equation detailed in this paper provides an excellent starting point for SMBs to evaluate the economic consequences of product choices.

SMB can use TCO analysis to determine their total cost per employee per month for voice and data services. Once this is calculated, we can easily compare the economic impact of each type of VoIP product (IP PBX and Hosted IP PBX) and traditional voice and data services.

Before making a final service provider selection, SMBs should consider other factors like a provider's responsiveness during the sales process, the strength and reliability of their VoIP network, additional services options and the scalability of their proposed solution.