The Definitive IP-PBX Guide

Understand what an IP-PBX or Hosted VoIP solution can do for your organization and discover the issues that warrant consideration during your decision-making process.

This comprehensive guide contains:

1. IP-PBX Overview
2. Hosted VoIP vs. Premise-based IP-PBX
3. The Benefits of IP-PBX
4. 15 Ways to Make the Most of an new IP-PBX system

Executive Summary

Premise-based IP-PBX (Internet Protocol Private Branch eXchange) systems are changing how small through large businesses implement and use their voice communications. They are the modern heirs to the historic PBX systems that were once the ultimate in business communications. But, premise-based IP/PBX systems are far more capable and lower in price than their predecessors. They also integrate far more easily into business networks and data communications, which in turn enable new applications, which are still being discovered and applied to common business practices, to be integrated into the work process.

Modern IP/PBX systems literally deliver multinational enterprise capabilities to even very small businesses, and are often at a cost lower than the far more basic systems they are replacing. This Buyer's Guide examines the premise-based IP-PBX market and tells you what to look for when considering a system. It also covers the relative advantages and disadvantages of a premise-based approach, while examining integration into existing business systems, so that these systems can offer higher levels of service and efficiency.

The bottom line with IP-PBX systems is that they can provide a relatively easy way for businesses of any size to move to VoIP and obtain a wide range of new features and capabilities for their phone systems. If your company is upgrading from a traditional TDM *(Time-Division Multiplexing)* phone system, the savings can be substantial and the new service will pay for itself in a short duration. In addition, businesses will want to take the time to understand these new systems and perhaps, invest resources to integrate their capabilities into existing business processes such as sales and CRM tools, for cost savings and better efficiencies.

IP-PBX Overview

An IP-PBX *(Internet Protocol - Private Branch eXchange)* is essentially an automatic switchboard for telephone systems. It provides the same basic functions for any business or enterprise that once the ranks of telephone operators with handfuls of wiring plugs did years ago. Those essential basic functions are to provide switching and connection between any two (or more) telephone users and make sure the connection remains in place until it is ended, at which point the system properly terminates the connection.

Any system that does this automatically for telephone calls within an organization is a PBX. The reason businesses moved to PBX's was to avoid requiring every employee to have a direct line to the public telephone system, each of which incurs a connection and a line charge. Instead, a smaller number of lines can be shared by all the users and managed by the PBX. This saves money and is more efficient.

All IP-PBX systems are basically exchange and extension managers for calls based on Internet protocol – also known as VoIP and Internet telephony. The essential advantage they offer to small- to medium-sized businesses is the ability to add features that up to now have only been affordable for large businesses. VoIP and Internet telephony are usually more cost-effective when looking at long-term operating costs due to lower monthly fees and much lower costs to connect and complete calls.

There are three basic kinds of premise-based phone systems. The first kind is called keyless systems or KSU-less systems. They are very lightweight phone systems designed for organizations with fewer than 10 employees that have very basic phone requirements. The advantage of these systems is that they are very inexpensive and easy to set up and operate. They are portable and can be moved relatively easily upon relocation. However, in a typical keyless system, you get very little support and maintenance from your service provider. Additional features - such as those that prevent users from picking up a line in the middle of another call are often impossible to implement. These systems are not considered IP/PBX's and are in fact being phased out since more full-featured IP-PBX systems are approaching them in cost, while delivering far more features and benefits.

The next largest premise-based system is called a key system. These use a KSU *(Key System Unit)* that acts as a central control unit, providing features and functions - such as extension management and locking users from accessing lines that are in use. These features aren't available on ordinary phone systems. Key systems are essentially closed, 'black-box' units that provide 80 percent of a basic IP-PBX system's functions for a lower cost. They are typically used in businesses with anywhere from 5 to 50 employees that require only basic business telephony needs. And nowadays, more often than not, key systems are in fact IP/PBX systems with some of the functionality turned off, which makes an easy path for growth and upgrading should the business require it.

Finally, there are full IP-PBX systems, the most common and flexible kind of business phone system. Even a low-cost IP-PBX can now offer a small business phone services that are indistinguishable externally from those used by multinational corporations.

Hosted VoIP vs. Premise-based IP/PBX

There are two primary types of IP-PBX solutions for business: hosted VoIP and premise-based IP/PBX systems. Hosted VoIP takes most of the switching and intelligence of the system and moves it off premise to a remote server location, where it is managed by the service provider. In a hosted Voip scenario the equipment at an organization's site is limited to the IP phones themselves; some dedicated routing equipment and perhaps a switch or gateway to provide emergency access to the older traditional TDM telephone network.

As a result, hosted VoIP systems are usually quicker and cheaper to install and set up. They offer a standardized set of services. And because they are hosted remotely, there is less server maintenance for a business and no need to perform upgrades. The downside is that upgrades and new feature additions are delayed until the service provider is prepared to offer them.   There is less flexibility and fewer options in configuring the system.

In contrast, premise-based IP-PBX's require application servers and switches to be located at the business site. Some downside points are higher initial startup costs, the need to manage and maintain the system and more difficulty with system expansion in the future. But, on the other hand, the organization can upgrade to new features at will and has full ability to configure and customize the system any way they like, which can be particularly important when thinking about integrating voice and data networks to create new applications and extensions of old applications.

With the arrival of open-source options for VoIP and IP/PBX solutions, a new breed of premise-based IP/PBX providers has arisen, supplying systems at even lower prices – and with rapid upgrades in capability. One common misconception of open-source IP/PBX solutions is that they are free, but in fact, any solution requires hardware (phones, server and switches at a minimum) and also incurs installation and configuration costs.

The traditional assumption is that hosted VoIP systems are a better solution for very small businesses, while premise-based solutions are better for medium to large companies. There are premise-based solutions aimed at companies with as few as 8 to 10 employees, and there are hosted IP IP-PBX's that can scale up to thousands of users. But this is a crucial area of differentiation, and great care should be taken to make sure that any solution can really match up well to your requirements in terms of size, usage and cost and perform with your network infrastructure.

Market Overview

The premise-based IP-PBX and VoIP has several factors keeping prices very competitive for customers. One factor is the previously mentioned rise in open-source IP-PBX's. Another is competition at the low end from the hosted VoIP market, and a third factor is the rise in the numbers of IP-PBX system suppliers and resellers competing aggressively for business.

Despite those factors, the primary reason that small and medium businesses are attracted to VoIP in the first place, remains cost savings, with the inherent advantage of completing all pure VoIP calls (both ends of the call are on a VoIP platform) for free, means that basic phone service is bound to cost less using VoIP.

Additional primary reasons that small-to-medium-sized businesses are adopting VoIP include access to features that are either not available or are cost-prohibitive on older phone systems. Examples of these include integration with desktop and office software such as Outlook, call routing features, and IVR *(Interactive Voice Response)* features, all of which used to be extremely hard to configure and were prohibitively expensive for small businesses. IP-PBX systems may be more complex to install and maintain than hosted VoIP services, but they are still far simpler and simultaneously more powerful than older key-systems and PBX systems.

Market research and surveys indicate that lower total cost of ownership and better system management are the primary factors for small businesses moving to VoIP, but that the technology is still misunderstood and early miscues, such as poor voice quality, have led to misperceptions in the market.

The bottom line is that the "perceived wisdom" about VoIP is that call quality is poor and the technology is difficult to implement. But the truth is that more than 80 percent of small businesses surveyed have responded that they are satisfied or highly satisfied with their decision to make the change to VoIP. In fact, modern VoIP systems have better call quality than regular phones.

Line shipments of IP-PBX systems will increase from 19.1 million in 2006 to 37.8 million in 2010. Global IP/PBX markets are expected to reach $26.9 billion dollars in the year 2009, according to WinterGreen Research, Inc.

Other market-research reports highlight increased growth in IP-PBX systems globally as the worldwide business market recognizes the importance of this technology to its future success. The important factor to recognize for any business that is looking to experience substantial growth is the comment about unified communications. Any systems purchased and installed MUST be capable of interaction with and integration by other communication's networks and data applications.

The report also concludes "the IP-PBX is no longer a standalone system, but rather just one component of a larger unified corporate communication system that includes e-mail, IM-presence, dual-mode phones, and video conferencing. Full IP-PBX deployments across the entire scope of the enterprise remain relatively rare and smaller companies are now beginning to gain sufficient confidence to deploy IP-based systems."

The Benefits of IP-PBX

In general the benefits of an IP-PBX to any organization are similar to and yet different from the benefits of a VoIP system. Obviously, the cost savings and reduction in basic wiring infrastructure from needing only one network for communication instead of two are clear. And the savings from the lower basic cost of completing external calls are also clear, but an IP-PBX brings far greater benefits because of manageability, upgradeability and enhanced feature sets.

The specific benefits of an IP-PBX over traditional phone systems include the following:

1. A cleaner and simpler infrastructure.
2. Lower operating costs.
3. Simplified equipment and maintenance.
4. Unified communications.
5. Improved scalability and growth.
6. Improved features for business operations.
7. Improved technological features and capabilities.
8. More efficient administration.

Specific Benefits

	Traditional Telephone	**VoIP**
Conference Calls	Special equipment is required for more than three people.	Can Easily conference large numbers of callers and make numerous conference bridges.
Mobility	Very difficult to set remote users up in systems if they are local.	Easily add remote users of any kind.
Phones	Can only provide traditional phone services, albeit complex ones.	Can be programmed to provide internal and external applications of all kinds.

Basic Features

Residential and very low-end VoIP providers often claim to offer business-class IP-PBX services, but except for very small organizations, it just isn't the case.   Even the most basic businesses now require a set of capabilities that would not have been possible even for the largest corporations 20 years ago.

In addition to the default IP-PBX features like call switching, call completion, call connection, call termination and accounting, the following should also be found in any premise-based IP-PBX system:

Call Routing Features

- **Automated Attendant**: An automatic system to answer phones with the ability to build phone menu systems, add call menus, transfer to voice mail and create flexible and programmable rules to handle all of these features.
- **Call Menus**: Flexible call management menus with user selectable options – a more advanced version of the traditional phone tree/menu systems. A better-quality system will let you have multiple sets of menus and even change them based on time or on information gleaned from caller ID.
- **Managing Extensions**: Features to help the phone system administrator, such as the ability to add new extensions, remove unneeded extensions, change extension locations and much more from a Web-based control panel.
- **Call Forwarding**: Automatic, programmed or manual call forwarding to any number or sequence of numbers.
- **Call Transfer**: The ability to transfer calls between extensions without going back to a central switchboard.
- **Call Parking**: Essentially a group hold – put the caller on hold in a waiting area so that any other phone system user can pick the call up.

Messaging and Management Features

- **Voice Mail and Voice Mailboxes**: Any IP-PBX should allow an almost infinite quantity, with far more flexibility than regular phone systems – more advanced features would include the ability to record all incoming and outgoing conversations automatically.
- **Call Hold**: Placing callers properly on hold with no drop off in queues with user selectable hold music and programmable options about handling hold time length.
- **Conference Calling**: Handling multiparty conference calls, internally and externally.
- **Web-Based Management and Administration**: To make it quick and easy to manage your phone system directly from a Web browser – this can include the ability to add configuration and management functions as well.
- **User Directory**: Some form of user directory and address book that is part of the phone system and is centrally updated.

Advanced Features

Other IP-PBX features can get extremely specific and the precise mix of features can make a big difference to business operations. Most of these advanced features come under areas like helping with remote offices and remote users, or programmability and flexibility of the system.

- **Scalability**: The ability to rapidly grow or reduce the system under your control. Better systems can scale to handle hundreds of users.
- **Rights Management**: Allowing different groups of employee's different rights within the phone system for management, administration, usage and more.
- **Group Management**: Managing groups of callers and call recipients.
- **Call Queue Management**: Providing visibility into and the ability to manage incoming call queues. This can include specific call management as well as general system management of rules and varying loads hold times and so on.
- **Programmable Routing and Scheduling** Time based management.
- **Call Routing**: Setting up programmed rules to route calls based on flexible criteria like caller ID or time, or even next available extension in the designated call management group.
- **Scheduled Call Routing**: Handling incoming calls differently based on time received – and even setting up several systems of call management that are all different depending on time of day or day of the week.
- **Automatic Ring Back Features**: Features to automatically return calls based on various programmable criteria.
- **Call Screening**: The ability to routinely screen calls as they come in.
- **Call Monitoring**: The ability to silently monitor calls as they progress for purposes like sales training and customer support.
- **Barge in**: The ability to break in to a call between two other people – usually related to call monitoring.
- **Branch Office Support**: The ability to manage and remotely administer extensions at other offices just as easily as if they were local.
- **Features to Support Remote Users as if Local**: One of the most powerful features of IP telephony is the ability to have remotely located employees work and appear too external and internal callers as if they are local.
- **Hoteling**: Allowing users to make any physical phone in the system act as if it were any other number, so that any user can make any phone on the system act as if it were their own phone for any period of time. This feature is particularly useful for telecommuters.
- **Unifying/Integrating Office Systems Full Outlook/Email Integration**: Incoming calls can be matched with contact management records and outgoing calls can be initiated from within Outlook so users can click on contact management systems records and dial from within Outlook or other applications.
- **Voice mail to Email**: Sending all voice mail from a mailbox to an email account where messages can be opened and listened to on a PC – as well as stored and managed.
- **Data Network Integration**: Some form of integration into your basic data network so that "click-to-call'" functionality, integration with office documents, email systems or even full blown CRM systems can be added.

- **Click-to-Dial**: Some form of click-to-dial to go from a number on a PC screen to a call on the phone without having to dial the numbers yourself.

Unique Features

- **Integrated Voice Response:** The system includes the ability for callers to navigate through menus using a phone keypad or voice responses.
- **Analog and IP Handling:** Many IP-PBX systems can manage both VoIP phone and regular telephone systems at the same time – although not all functionality is available to regular phone users. This feature is useful for managing merged groups or multiple sites.
- **IP Fax:** A fax system integrated into the IP phone system. You cannot use regular fax machines directly on IP phone networks without some kind of interface.
- **Presence Features and IM Integration:** Presence features indicate the status of a user of the phone system to all other users and even to external callers if features are supported. These indications can be as extensive as to indicate location, kind of devices by which communication can take place, and transfer between routing methods.

Cost

Premise-based IP-PBX systems vary widely in cost from one extreme to another and even more so as you look at wide-scale deployments and future growth and additions to a system. A basic premise-based server for a relatively small number of users – say up to 20 in a single location – can cost less than $1,500 excluding the phones themselves. But expansion costs and other branch locations can change the cost equation dramatically. In addition, you will have ongoing costs related to connections made to the regular phone system and whatever additional connection costs are imposed by your backbone supplier. These ongoing costs are nevertheless going to be considerably lower than any other form of phone system. They should be lower than hosted VoIP solutions, and they will be dramatically lower than any older PBX and telecommunications provider.

Expansion and growth into other locations can incur other additional "hidden" costs, such as the need to buy expansion boards and cards, and other additional hardware for IP-PBX server. These costs are often not quoted directly and can take some sleuthing to find. So remember to query any potential provider about expansion costs and peripheral costs, including add-ons, before you commit to a contract of any kind.

Phones are an additional cost, but when buying a premise-based IP-PBX system, you often have greater flexibility than in any other arrangement. You can choose to go with very low-cost, no-name or bottom-of-the-line phones (which are still perfectly capable, but may be limited in their feature set) all the way up to top-notch phones from manufacturers such as Polycom and Aastra that provide usability benefits (although often at a price premium).

ROI *(Return On Investment)* can be very difficult to estimate since it depends mostly on the system being replaced. If you are upgrading from an old legacy system, then a premise-based IP-PBX is going to save you a considerable amount in operating costs, depending entirely on your current call costs.

The difficulty comes if you are comparing hosted IP-PBX with a premise-based IP-PBX system, because predicting costs on premise-based equipment is much harder. With premise-based systems, purchase and installation costs can be difficult to determine precisely until full engagement on a purchase and ongoing maintenance and calling charges are established.

Expansion and growth into other locations can incur "hidden" costs, as well, such as the need to buy expansion boards and cards for IP-PBX server systems to allow for greater processing power or more switching connections.

The typical scenario is that the longer you keep a system and the more users you have, the more likely it is that a premise-based solution will compare favorably.

The bottom line: If you are upgrading from an old phone system, you will save money no matter what. The real differentiators for recommending a premise-based solution are the need for customization, the need for full control of the system, special applications that must be enabled and the size of organization; the larger the organization, the more likely a premise-based solution is the right call.

Premise IP/PBX Checklist

What to ask before you buy.

You will need to know the following about your current situation:

- ✓ How many employees are in your organization?

- ✓ How many locations do you have that need VoIP service?

- ✓ How many remote or mobile users do you have that will not have a local office?

- ✓ What are your current broadband connection details – bandwidth, type, lines and so on? Make sure to have as much information available as possible, including your supplier and level of service.

- ✓ What is your current network load and available unused bandwidth? Your provider may want to test your network to determine this information for them selves, and if you don't have enough you may need a network or broadband upgrade.

- ✓ What type of servers does your system run on? Your service provider may need manufacturer, model number and, most importantly, operating system details.

- ✓ What are your existing phone system details - manufacturer, number of lines, connections and so on?

- ✓ Will you need to or want to keep existing lines?

✓ Will you only be upgrading part of your organization?

✓ What is your budget? What is your total project cost limits and target cost per month per user?

✓ What is your mix of calling - average amount of internal, local, long-distance and international calls per month? If you don't know, have a few months of current phone bills handy.

✓ What is your percentage of inbound versus outbound calls?

Be sure to specify your business requirements up front and make sure you know which requirements you are prepared to drop in return for a lower cost. In practice, you are likely to have a few business-critical features in mind that along with certain basic phone features are the must-haves that your selection will depend on. Everything else will be optional, but keep an eye to the future, even if it seems far off.

Typical issues that change costs involve:

✓ Do you need an incoming 800 number?

✓ Do you have a receptionist/phone operator or do you want an auto-attendant?

✓ Do you need to be able to make conference calls? How large, how many and across how many locations?

✓ Do you need a call center?

✓ Do you need integrated voice response (voice menus)?

✓ Do you have someone available to manage the system for your employees or are they going to have to do it themselves?

✓ Do you need to integrate with Outlook or other office systems?

✓ How fast are you going to need to grow the system and how frequently?

✓ What level of service and SLAs *(Service Level Agreements)* do you need?

Conclusion

Premise-based IP-PBX systems provide small to large businesses with all the abilities and features that are available to large enterprises, while providing the potential to reduce long-term operating costs considerably.

As with any rapidly growing technology, there are a wide variety of providers with a range of features, all at greatly varying prices.

IP-PBX systems can cost as little as $900 to install, plus the cost of phones. Operating costs can be as low as a few dollars a month. It is more important to make sure that your system has the basic features that you require now for the operation of your enterprise and for its future growth, than to drive the cost to the absolute bare minimum. Unless you are already using an efficient IP telephony system, you will save money no matter what.

In any upgrade to a premise-based IP-PBX you should look for:

1. Basic operating-cost reductions due to lower call charges, the need for only one communications network and lower maintenance costs

2. A minimal investment risk, because your enterprise data network is your new backbone and it is already in place and functioning effectively

3. Straightforward installation costs based on tested, reliable components connecting to a system your IT personnel already understand

4. Improved efficiency and operations within your organization

5. New functionality that can improve your business's effectiveness

It is the last of these points that are most important and will be critical to the success of the upgrade. This is where the power of converged networks – combined voice and data networks – really comes into its own. It provides your enterprise with more tools, more capabilities and more options that it has previously had. The cost savings are essentially a bonus.

Zeracom's IP-PBX Positioning

Having been founded in 1993 in Greenville, SC (*originally as Intertelcom*), Zeracom has positioned itself at the front of upstate South Carolina's telecom service industry. With a team of certified professionals the direction has been to bring the best technologies by delivering on the challenges that our valued customers have requested of us. Having recognized for some time the advancement in traditional telephony and the evolution of voice as another data application, we have moved to leverage our expertise to bring our customers the advantages of these changes. We embrace the philosophy of placing the customer in control, by using our easy to use, intuitive control panel administration, which will save significant costs associated with changes that were until now done by telecom vendors. We also have leveraged our resources and experience for remote administration, as an off-site partner for customers who want partner support.

ZeraBox® is an Asterisk™ IP-PBX designed and built and sold exclusively through Zeracom, South Carolina's Upstate Award Winning Business Technology Solutions Provider. With 15 years of successful communications business, providing integrated voice and data services, Zeracom has specialized in networking and communications, with PBX installations, upgrades and repairs. Having a cutting edge IP-PBX ZeraBox, with a dependable and time tested Asterisk™ PBX software, Zeracom's vision to provide a truly affordable dependable enterprise business phone system for the small to medium business has been realized.

Tips to help IP-PBX users optimize their business phone setup.

For those of us who were around in the mid-1970s, the idea of a telephone switchboard – or at least the old phone company - may be forever tainted by the "Saturday Night Live" skit in which Lily Tomlin, as a switchboard operator, randomly disconnects calls and infamously declares, "We don't care, we don't have to... we're the phone company."

Thankfully, the last 30 years have brought switchboards into the electronic age, and through IP-PBX *(Private Branch eXchange)* technology, many businesses no longer rely on telephone companies (or their operators) to complete many of their calls. Instead, many companies use internal telephone switchboards, known as PBX systems – the successor to IP-PBX s systems, which use IP technology whenever possible to deliver voice calls.

PBX's started out as internal company switchboards that required operators to manually direct calls from one person to the next. By the 1980s, manual switchboards had largely been eliminated, replaced by automated switchboards, which performed the same function but did not require an operator to manually route the call.

Instead of routing calls through old four-wire PSTNs *(Public Switched Telephone Networks)*, modern IP-PBX solutions use the Internet protocol to exchange information. Moving to IP networks has greatly expanded the functionality of IP-PBX systems; instead of being restricted to the office, users are now able to work from virtually every corner of the globe and still make full use of their company's IP-PBX features.

But there is still a catch. To make full use of the system's features, you have to know what they all are, as well as how to set up and operate them. Keep in mind that modern IP-PBX's are very complex and receive constant functionality upgrades.

Standard IP/PBX Features

15 Ways to Make the Most of a IP/PBX System

Are you getting the most out of your IP/PBX system? Almost 100 percent of modern IP-PBX systems come with the features mentioned in the following section. Surprisingly many IP-PBX system owners do not know these very basic features exist, let alone how to best use them.

This article serves as the first step to understanding your IP-PBX and maximizing your company's productivity using an IP-PBX. These tips will help beginners optimize their business phone setup, as well as make users familiar with some IP-PBX functionalities they might have overlooked or underused.

1. Automated Attendant

Perhaps the most critical feature to any phone system is the automated attendant. The automated attendant serves as a virtual receptionist, directing calls to the different departments, voice mailboxes and extensions on your network. A well-programmed automated attendant gives your business the power to manage a high volume of calls without a high volume of personnel dedicated to answering phones.

When designing your automated-attendant system, keep in mind that users do not want to go through two minutes' worth of call-directing menus only to have a 15-second conversation with customer service, or be connected to a voice mail or even worse lost in telephone limbo. Try to avoid redundancy and direct the caller as quickly as possible. In addition, conduct usability surveys with strangers, not just internal employees, in order to get an accurate picture of diverse set of user experiences. After the system is in place, follow up to see where user complaints are directed and what portions seem to be operating least effectively in order to fine-tune the system.

Make sure you know the two or three people, groups or departments that are most frequently requested and move the options to select or transfer to these to the beginning of the selection process. That way, you can get most of your clients and customers to where they need to go as fast as possible. If a particular topic or question crops up repeatedly think about adding a menu option to deal with it.

If your system supports it, allow experienced users to jump straight in and transfer themselves without delay. And the final golden rule is to not leave the caller hanging: If they wait through the whole system and don't select anything, either repeat the options or move them onward to the destination that's most likely to help them resolve their issue.

2. Call Forwarding

Every efficient system MUST be able to automatically forward calls to various destinations within the IP-PBX network. If a user can't get to his or her phone, the system can and should forward calls to whichever destination makes the most sense: their mobile phone number, their co-worker, their supervisor, their voice mailbox or any other destination based upon company business needs. Too often companies fail to consider other call-forwarding options beyond voice mail and thus lose company efficiency, employee and consumer satisfaction and potentially even business. Make sure that you do not forward to a full mailbox or to an empty line; give the caller the option to step back out and find someone else if they so desire.

IP-PBX systems that lack the capacity to forward calls to the correct destination in a timely manner can cripple a company's incoming communications. So make sure to compare forwarding capabilities before purchasing an IP-PBX system.

3. Call Accounting

If you're serious about keeping a tab on your company's telephone usage, a call-accounting system is a must. Call-accounting software records various call information including "calling party, date, time, duration, destination party, and authorization or account code".

With accurate call-accounting records, you'll be better equipped to bill customers for support calls, gauge which employees are spending too much time on the phone, determine if any section in your automated attendant is creating a bottleneck and compare your records to the IP-PBX server or telephone c ompany for any payment discrepancies.

Make sure that you are getting accurate information by coding groups and departments correctly and refine your call accounting reports so that they deliver information in an easy-to-use form.

4. Conference Calling

Conference calling is one of the more powerful features of an IP/PBX. Instead of exchanging a series of emails with your co-workers to debate an important topic, conference calling gives you the ability to communicate with a large number of people in real time over the phone. You've already made the investment in an IP-PBX system, and if your employees don't know how to set up their own conference calls, you are just wasting a valuable resource and your staff's time. Many companies that switch to IP-PBX systems continue to pay for expensive external conference-call hosting systems when their new internal IP-PBX can manage conference calls more easily and for free. Take advantage of this cost savings.

Provide training if necessary, and modify any IP-PBX options to make conference calls as easy to use as possible. Make sure you allow remote and even external callers to be part of conferences; a good IP-PBX system can even save you the need to use an external conference-call service for customers.

5. Voice Mail

The seamless transition from user to voice mail is a vital component of every IP-PBX system. When the IP-PBX system is busy (or no one is at the office), voice mail takes over logging calls and messages from both clients and co-workers.

Sometimes, you'll be extremely tied up at the office or will be fielding a lengthy important phone call and just can't get to any other customers. Instead of losing those customers' business or having a receptionist take a message and forget to give it to you, voice mail allows that customer to record a message that you can check at a later time from any remote location. When setting up your system, however, it is important to consider whether the same voice mail message is appropriate for every caller. Would it serve your company better for customers and co-workers to receive different voice mail messages? If so, have you configured up your IP-PBX to make that happen?

Also take advantage of any flexibility in system messaging. Instruct employees to provide different greetings for calls that arrive when they are on the phone versus away from the desk. Make it easy for them to set up "out-of-the-office" messages and turn them off when they get back.

6. Call Holding

We've all been placed on hold at one time or another, only to sit in silence or have our call dropped after more than 20 minutes of idle time. This can be one of the most frustrating aspects when dealing with other businesses. Thankfully, almost every modern IP-PBX system provides a company with the ability to play music, advertisements and estimated wait times while customers are on hold. When configuring your call-holding feature, have both internal and external callers test the system to make sure that the user experience is as customer-friendly and reassuring as possible.

In addition to reassuring callers with music or real-time queue updates, a fully functional IP-PBX call-hold system places users on hold in a priority queue and distributes calls accordingly without dropping them or losing customers due to excessive wait times. Consider whether your company would benefit from implementing priority criteria for wait times from particular callers. For example, if your biggest clients call

in, you may want to bump them ahead of smaller clients. These decisions require a difficult balance, but if you aren't asking them at all, you aren't using your IP-PBX optimally.

Make sure that you provide clear alternatives to waiting on hold. These can include simple advice on the best times to call to get through; other avenues to gain access or information other than the telephone, and the ability to back out if you have ended up in the wrong call queue.

7. Configurability

What good is an IP-PBX system if you cannot customize it to your company's profile and customer needs? You should be able to configure call-attendant menus, schedule events, and customize on-hold messaging and so on. When a customer calls your company, they should be greeted with a unique welcome message, not a pre-programmed, generic message. An important first step is to make a list of all the potential callers; include categories of co-workers and customers. Then create relative priorities between these callers and create a list of the particular needs of each caller. Only once you have compiled this master map of callers should you begin to configure your IP-PBX system, which will ensure that your setup will be compatible with all callers, not just those that come to mind during the setup process.

All of these customizations play an important role in making the customer feel significant, and they provide more information about your company to the customer. In addition, they serve an important role in the productivity of your company. Streamlining the internal call process can shave seconds off each call, and with thousands of calls made per employee per year, those seconds translate into very significant productivity gains.

Advanced IP/PBX Features

8. Consolidation

One of the more popular advanced IP/PBX features takes on the "unified messaging" role, bringing together all of your telecommunications devices into a single convenient system. IP-PBX can bring together your cell phones, analog phones, and VoIP phones, email, and voice mail, IM (instant messaging), chat, video calling and more.

The technology works by linking all of your office devices together and messages you on the appropriate device based upon your availability. The IP-PBX system might try your cell phone first, your office phone second and finally a conference room - or maybe all three simultaneously, depending on the settings. Whatever the case, the IP-PBX system knows how to get hold of you, and you should use that capability to your company's advantage.

If your employees are on the road and need their cell phones to act like their office phone, your IP/PBX can do it. IP-PBX consolidation gives you the freedom to work wherever you see fit and still receive all the unique telephony features the technology has to offer, including line extensions, conference calling, and call forwarding and so on. If your company isn't currently incorporating consolidation technology into the IP-PBX system, it is losing significant time and money by having "out of office" equal "out of touch" when it comes

to your employees.   Make sure that employees know how to make use of the system and encourage them to use the technology to be more efficient.

9. Personnel Locater

After consolidating all of your IP-PBX features into one unique system, you are on the way to having a fully functional mobile work force. But what happens when you need to know exactly where one of your employees is? Not to worry: IP-PBX systems can keep track of where your employees last interacted with the system, data that will allow you to pinpoint their exact location. This technology, known as telepresence, tracks all interactions with the system - including email and IM - and makes deductions about an employee's location. It also gives employees tools to indicate their status, including do-not-disturb notices at several levels (for instance: "I am available for my supervisor and my family only right now.").

Some IP-PBX systems go as far as to incorporate GPS and RFID (radio-frequency identification) technology into their locating software. In such instances, your IP-PBX system would know not to try your office phone when you're away from the desk or would know to cut straight to voice mail when you're at home. These cutting-edge features will not be available in all IP-PBX systems, but if you are planning a purchase or an upgrade, now is a good time to make sure of what features you want.

10. Email Integration

Modern IP-PBX systems have the ability to merge with email clients (such as Microsoft Outlook) and retrieve contact information on the various customers you're on the phone with. Once a call is received, the customer's name and phone number is automatically matched with existing records in your email-contact database, and their complete customer profile is brought up on the screen. From there, you can get a more thorough idea of who you're dealing with and will consequently know how to better serve their needs. You can also initiate calls from within other applications.

IP-PBX telephony also boasts the capability to transfer company employees' voice mail messages to their company email account. T he messages are sent as easy-to-access audio files and allow employees to store and manage all of their voice mailbox contents. This feature also lets users easily access voice mail on the road without having to dial in.

11. Total 'Business Intelligence' Integration

If you've successfully integrated email into your IP-PBX system, why not take things a step further and integrate your entire business intelligence operation? IP-PBX systems have the ability to communicate with your computer and the customer databases you keep on that computer. To merge the databases and IP-PBX, simply take the call information from your customer, and probe the database and presto - you now have all of that customer's contact information, previous interactions, and purchase history and so on.

Properly incorporating business intelligence and your IP-PBX will allow for more streamlined and targeted customer relations, as employees will immediately know background information about the customer, that customer's history with the company, past issues they have had and whether they have been flagged as a particularly important or problematic client.

One of the ways that you can take advantage of this technology is by analyzing your customer's purchasing records and determining what they'll need next as the call takes place. At the same time the call is taking place, you can email the customer quotes about your latest products that are related to previous orders he or she has placed, as well as go over these new products during that same call.

Thus, the integration of real-time-accessible business-intelligence data will allow you not only to better serve your clients, but also to predict which products they might be interested in, thereby using the call as an opportunity to pitch those new products.

12. Call Routing

Advanced IP-PBX functionality allows for calls to be routed based upon certain criteria, including caller importance, length of wait, time of day, day of week and so forth.

For example, if the president of your company is calling for sales statistics, it's probably not a good idea to have him wait in the standard customer queue. Likewise, if someone is calling after certain departments are closed, it's probably better to patch them through to the operator rather than have them traverse two minutes' worth of menus to find out the bad news.

Just as with call holding, caller mapping is the key to an efficient call-routing scheme. Unless you know all the variants of calls your company receives, you cannot begin to create an IP/PBX routing system that will properly treat all of those callers.

13. Analog vs. IP Phones

To provide the greatest range of flexibility, modern IP-PBX systems are able to direct calls through both analog and IP-based phones. The biggest benefit for companies here is the ability to keep existing phones, while upgrading the overall system.

Once you have done that, however, you need to look at the capabilities of the phone itself to make the most of them. Some IP-PBX's extend all functionality to even the most basic of analog phones, while others do not. To begin with, you should make sure that employees with a great deal of training in the old phones continue to use them. But you should also look at the specific functionalities and ease of use and pass the higher-functionality equipment on to those users who need it the most.

14. IMS (IP Multimedia Subsystem)

To take your IP-PBX system to the next level you should make sure that it has the technology to provide IMS functionality. IMS allows users to send and receive multiple types of media across a network, rather than just hearing voice on a standard IP-PBX system or reading text on a SMS *(Short Message Service)* system. For instance, you could videoconference or give an extensive presentation in real time. To exchange full video calls to and from every user, you will need to provide video phones or perhaps webcams to each user, but initially, for example, conference rooms can be video-call-enabled.

15. Virtualize Your Phone

Most IP-PBX's now support 'Hoteling' – essentially the practice of treating every single phone, or even communications device attached to the system, as equivalent. You sign in to the phone just as you do on a networked computer and that phone temporarily becomes your phone. C alls to you are routed straight to that phone, while calls from you show up on caller ID as being from your regular phone. And this feature can be set up to work from any location, allowing all employees to effectively be at their desks no matter where they are.

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