

## VoIP phone systems introduction

VoIP (Voice over Internet Protocol) represents the latest in phone system technology. With it, regular voice calls are sent over a computer network instead of traditional phone lines.

VoIP has been touted as “coming soon” since the first PC-to-PC telephony applications were introduced in 1995 – and it looks like it may have finally arrived. In recent years the audio quality has improved drastically, the technology has gotten cheaper, and business adoption has started to spike.

VoIP systems are expected to represent almost 60% of small & mid-sized business lines shipped in 2011, according to the Dell'Oro Group.

There are two basic varieties of VoIP. In its most straightforward form, VoIP requires a regular phone, an adapter, broadband Internet service, and a subscription to a VoIP *service*. When you place a call, it is sent over the Internet as data until it nears the recipient's destination. Then the call is translated back into a more traditional format and completes the trip over standard phone lines. Also known as Internet telephony, this allows for extremely cheap long-distance and international calls.

This Buyer's Guide, however, addresses VoIP phone *systems* – equipment installed at your business that routes internal calls over your computer network. With VoIP, you can unite multiple offices on a single phone system. No matter how remote the locations, a VoIP phone system can completely eliminate long-distance calling charges between them. However, it does *not* replace your existing phone service to the outside world.

VoIP phone systems can work for the smallest offices and the largest enterprises. In fact, IP PBXs will likely replace traditional PBX phone systems as prices fall and reliability improves, which helps explain why so many IP PBX manufacturers are familiar telecom heavyweights. Submit a free VoIP phone systems price quote request to get matched to multiple dealers who will help you select the right features.



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### Pricing guidelines

VoIP system prices vary considerably based on the features you want and your existing telephony infrastructure. Here are some very rough estimates – we'll go into more detail in VoIP phone system pricing on page 6.

- 16 phones: **\$10,000 to \$30,000**  
(includes typical phone system features and installation)
- 64 phones: **\$50,000 to \$75,000+**  
(includes dedicated servers, voicemail)

## Is VoIP right for your office?

The buzz around office VoIP phone systems has been constant enough that many businesses think about diving into one without really understanding their benefits. Contrary to the assumption many potential buyers start with, a VoIP installation is **not** a guaranteed way to save money.

Additionally, features alone are not reason enough to upgrade right now. However, there are some specific situations where VoIP can make an immediate positive impact on your business.



### Multiple locations

If your company has multiple locations – branches, telecommuters, remote sales offices – that are already connected to a company Local Area Network (LAN) or Wide Area Network (WAN), you are a prime candidate for a VoIP system. You can share the full features of your phone system across all your locations.

Even if you have one office in Connecticut and one in California, VoIP allows calls between them via extension dialing, making it a zero cost call. For businesses with hefty monthly long distance charges due to calls between locations, that can be a very attractive reason to upgrade.

### Infrastructure savings

An office VoIP phone system can also save money if you're running new wiring – you won't have to run separate cabling for your phone system. However, if you are setting up a new data network anyway, setting up a parallel voice network at the same time is relatively cheap so the cost savings here might not be as large as you expect.

The best solution for you might be a system that uses existing phone wires within the main office and VoIP for calls between locations. This combination works well if you have relatively new telecom equipment – many PBXs can be IP-enabled with software upgrades and minor hardware additions. Or, if you are ready to replace an aging PBX, it may be a great time to move to IP PBX.

Sticking with traditional phones internally will save you money, as well as increasing the overall reliability of your phone system. Vendors can also set up systems that use only traditional lines and extensions at first, but support later expansion to VoIP.

## How does voice over IP work?

The premise behind VoIP is fairly straightforward: instead of using “circuit-switched” technology, where a dedicated path from caller to receiver is reserved for their entire conversation, voice over IP phone systems treat voices as data, turning your words into tiny packets of information that are sent over data networks. As they arrive at the receiving end, the data is turned back into audio.

To set up a business VoIP system, you need several components. A central device manages the calls, the way a private branch exchange (PBX) or key system unit (KSU) does in traditional phone systems. This can be a dedicated piece of hardware such as an IP PBX, a regular PBX that has been IP-enabled, or a server running specialized software.

You'll also need phones and a data network. In many cases, you may be able to use your existing digital phones and computer network, although you may need to upgrade some of your network hardware.

Depending on your setup, internal calls are routed over your existing phone network or your computer network. Internal calls within the same office will typically be conveyed over your phone network while calls to other company locations get routed over your computer network.

Calls to external phone numbers get sent through the network to a gateway, which connects to the public telephone network. All of your voice over IP calls connect seamlessly to any phone user – there are no compatibility issues to worry about.

### Features and benefits of VoIP

The single biggest advantage of VoIP is for businesses with multiple locations. With VoIP, any and all offices on your network can get the benefits of having a common office phone system, including extension dialing, seamless call transfers, and all other features. In addition to making it easier to communicate, this can enhance collaboration as employees at different locations can truly feel like they're part of the same organization.

Plus, if they are on the company network, the phone calls are free – even if your offices are located thousands of miles apart. Simply looking at your current phone bill for calls between far-flung offices will give you an idea of how much you can save.



### Simplified management

There are other cost savings that stem from the streamlined network infrastructure and improved administration. For network administrators, VoIP means they only have one network to maintain instead of two. There is still separate phone system hardware to maintain – but only one network.

The Move, Add, Change (MAC) process also is greatly simplified, because almost all VoIP systems are configurable through a web interface that can be managed by the administrator. This means lower ongoing costs -- you will not need to call your vendor for every MAC. And because multiple offices are seamlessly connected, they can share a single receptionist, auto-attendant, and voice mail system.

### Additional features and integration

Even more compelling is the integration of business applications with your telephone service. VoIP can enhance communications that help users find the best way to contact co-workers—whether through a phone call, IM, or e-mail. When integrated with CRM applications, it can boost productivity by letting users place a phone call simply by clicking on someone's name in a Word document or web page.

Another significant benefit is for employees on the go. If your remote users connect to the company network via a Virtual Private Network (VPN), VoIP allows them to make phone calls from the road at no extra charge. One salesperson on an extended trip can save hundreds of dollars in cell phone or hotel long-distance charges. All the user needs is a "soft phone," (software that lets a laptop function as an IP phone), a PC microphone, and speakers.

Other familiar and essential phone system features like caller ID, call forwarding, simultaneous ringing across multiple phones, and other features you would find in PBX systems are available in most VoIP systems.

An IP PBX, the heart of most VoIP systems, should also work with advanced Computer Telephony Integration (CTI) applications such as call center management. These popular applications prioritize incoming calls based on the caller's identity and automatically bring up account information as the phone is answered. However, there is little difference in this arena between

**If your business has multiple locations, any and all offices on your network can get the benefits of having a common office phone system.**

VoIP and modern digital phones.

You might also want to take advantage of IP videoconferencing. In the wake of rising fuel prices, companies that used to gather far flung employees together for important face-to-face conferences now turn to videoconferencing over IP.

### Wireless solutions

With the extensive use of cell phones in the business market, there is an obvious connection to wireless VoIP. Since cell phone coverage is often poor inside buildings, wireless VoIP offers some significant advantages. Your business will need to take a more detailed look at the state of wireless VoIP and weigh the benefits and risks.

### Potential drawbacks to VoIP systems

The two main drawbacks to VoIP systems are the network requirements and the potential for outages.

#### Network demands

One challenge to maintaining IP call quality is bandwidth: high quality sound requires quite a bit of it. Add to that the fact that once you move to a VoIP system, you're now running all your business communications over one network. This means that the bandwidth used to access databases, work files, e-mail and the Internet is now sharing the same space as your voice communications.

The technology to compress audio and to reconstruct it improved to the point where VoIP sound quality over a high-bandwidth connection is as good as or better than that of regular phones. But some networks that are fine for data are not up to the demands of VoIP.



Computer networks are designed to handle messy data: packets arrive out of order and some are even lost, but in most cases the data being sent can easily be reconstructed before it is needed. Voice conversations, though, are not as tolerant of these kinds of disturbances.

Instead, each packet of sound has to arrive in the correct order because they are being sent in real time – if packets are lost, the conversation sounds distorted, choppy, or falls off all together. This is why VoIP services that rely on the Internet to transmit calls can have uneven phone quality.

If your company will be routing calls over private data networks, much of this potential problem is avoided. Companies shopping for VoIP generally have networks

suitable for high-quality voice conversation – frame relay networks are ideal, but standard Ethernet networks are fine. However, they may need to be boosted with a Quality of Service (QoS) application.

QoS maintains a dedicated amount of bandwidth for voice calls by giving voice data a higher priority as it is trafficked through the network. If there is network congestion, VoIP data is routed through first so call quality does not suffer. QoS applications are built in to some VoIP systems, as well as some routers. They can also be purchased separately as upgrades.

From every indication, running VoIP on a company network without QoS is a risk no business should take. If you have a WAN that routes data over the Internet, you can still run QoS, but there can be no guarantee of quality. Internet call quality can reportedly be improved if the various offices use the same Internet service provider.

## Outages

Unlike regular phone systems that get set up and basically forgotten, VoIP systems require more attention. Like any software application, your VoIP server will require occasional upgrades and maintenance.

Since regular phones get all the power they need through the phone line, they continue to work if there is a power outage. In contrast, most VoIP phones need to be plugged into a power source to work.

By definition, VoIP phones are also network-dependent. To businesses where phone service is absolutely critical, this can be a concern since computer networks can occasionally be brought down by a server crash or other problem. However a good IT staff can prevent most outages and react quickly when one occurs.

Potential outages are another reason why having a mix of digital and VoIP can be advantageous: it creates a more comfortable level of redundancy. Companies that have backup power systems in place can keep their PBX running, and the digital phone system within the main office will continue to operate even if the data network is unavailable.

## Choosing a VoIP system

Once you have decided that VoIP is right for you, the next step is to determine what of your existing telecom equipment you can keep. Many PBXs can be IP-enabled with software upgrades and minor hardware additions, and you may be able to use digital phones you already own. The potential cost savings are significant, and you can also increase the overall reliability of your phone system.

When comparing phone systems, make sure you investigate the details carefully. Many systems say they include “everything” but may not include the specific features you require. Exactly what makes up a “complete” system varies from vendor to vendor, so be sure you are comparing equivalent systems.



## Open standards and open source

You may also want to learn whether the phone systems are built on **open standards**. While all VoIP systems use the industry standard Internet Protocol (the “IP” in VoIP, remember) to route calls, some use proprietary technology for administration or integration features. Having a system run entirely on open standards can allow for greater flexibility in integration and customization.

Going one step further, **open source** VoIP programs and applications offer a great way for many businesses to save hundreds or even thousands of dollars every year in telephony costs. Better yet, open source programs are fully customizable to a business’ specific needs, making them a popular choice in many IT departments.

On the other hand, you may not be as concerned about flexibility as long as the features and costs match your requirements. The technology used in a particular system may impact whether you can leverage your existing equipment, so be sure to inquire about compatibility issues.

Lastly, remember that some common business devices *require* analog phone lines – notably fax machines, but also credit card processors, some security systems, and other devices. Make sure your vendor knows and plans for these types of uses when planning your phone system.

## How to buy business VoIP systems

The rapidly maturing business VoIP system industry means that there are **many manufacturers with feature-rich systems** that may be enticing to small firms.

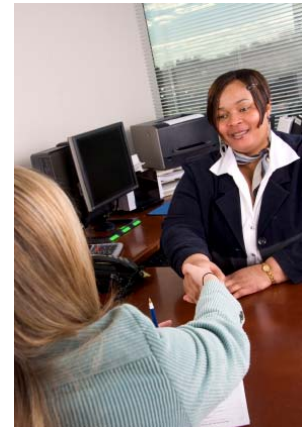
### Sales channels

Buying VoIP for business from a local reseller is the best choice for most buyers. Licensed, certified resellers have proven expertise, manufacturer support, and the ability to respond quickly to urgent problems that require a site visit. Checking that the reseller has manufacturer support is particularly important -- this can be critical as upgrades are released or problems crop up.

Keep in mind that some vendors, particularly those whose background is in data networking, sell VoIP-only systems. This can drive up your costs unnecessarily when a hybrid traditional/VoIP system might be fine for your needs.

Also watch out for vendors that simply add VoIP to your existing network whether or not it is fully ready to support voice traffic. They may later charge you for upgrades if you decide the call quality falls short of your expectations. Make sure you get a thorough analysis of your current network and the impact VoIP will have on it to get a true sense for your phone system costs.

Whatever you do, don't be tempted to do it yourself – setting up and maintaining a business phone system of any type requires specific expertise. There are many resellers and service firms that customize, install, and maintain VoIP systems – submit a free request for VoIP phone system quotes to find expert vendors in your area.



### Pricing

Business VoIP system prices vary considerably based on the features you require, your existing telephony infrastructure, and the state of your data network. A complete 16-phone VoIP solution with all the features you would expect in a typical business phone system can run from \$10,000 to \$30,000 or more, installed. A 64-phone installation including a dedicated server, voicemail, and more, could cost \$50,000 to \$75,000 and up.

That is considerably more than a similar digital phone system would cost, but the long-distance savings on interoffice calls and the reduced administrative costs will offset some of the difference. See what other

BuyerZone users paid for their VoIP phone systems.

### VoIP system buying tips

- Before you commit to VoIP, **evaluate the potential savings** around toll-free calling between all locations. If you're only spending \$100 per month, think twice before making such a serious investment. Don't buy just for the sake of having the latest technology.
- **Plan for the future.** The cost difference between including extra capacity at the beginning of a project and adding more VoIP equipment later is significant – build in room for growth.
- **Don't try to save money buying used.** The technology behind VoIP systems is evolving so rapidly that even last year's hardware is extremely dated. Plus, the installation cost is a significant portion of the price, and that won't change significantly with a used system in place of new. You also set yourself up for a shorter lifespan, higher upgrade costs, and more maintenance – in short, the deferred costs will almost certainly wipe out any upfront savings.
- **Investigate your vendor.** Do not take a chance on unlicensed or unauthorized vendors. Your state board of electricity can tell you if a vendor is **licensed**, which verifies that the vendor is bonded, covered with insurance, and generally in good standing with the state. **Authorization** comes from hardware manufacturers, and means that the vendor has passed competency exams and committed to ethical

practices. This gives resellers the ability to access the manufacturer directly for VoIP equipment upgrades or tricky installation problems.

- Some vendors will take your system's documentation with them when they are finished, leaving only the user guides. **Make sure you get all the administrator documentation and the passwords!** Most VoIP systems today have web interfaces for making simple admin changes like adding users, but you will need the documentation and the admin password.