

telephone tech

Do You Feel
the Pressure of the
Bleeding Edge?

Technology is changing daily and telecommunications is no exception. There are new terms, new ways of doing things. You, the consumer, are left trying to assess which technology is right for your organization.

Most magazines tout IP (Internet Protocol) as the next best thing, and if you don't have it you will be left behind. While there will most likely be a time when IP telephones completely replace digital telephones, the consumer still has choices today. To make the one that's right for your situation, you first need to understand this new technology.



by Julie Drake



VoIP

VoIP stands for Voice over Internet Protocol. It is the use of data transmission to move voice from one location to another. It converts the voice transmission into a data stream of 1s and 0s that can be transmitted via the Internet. This technology was and still is used to connect campuses and other remote locations. The benefit is that it uses existing data circuits without segmenting bandwidth specifically for voice traffic. Therefore, the data vendor or internal data personnel accepts the fact they still retain all of the bandwidth for their data needs only as long as there is no voice in use.

IP Telephony

This is a broader scale deployment of the VoIP technology. This is moving voice traffic over a shared data network within or between buildings using a voice “server” that is connected to the data network. The connection is the same as the main database servers or e-mail servers. The voice server uses IP telephone sets, most of the time in a proprietary setting (e.g., CISCO to CISCO, Avaya to Avaya). Even as early as the fall of 2005 this was “bleeding edge”

technology and many companies were just dipping their toes in the water to test it out. Today, more companies are embracing it.

How an Agency Should Look at VoIP/IP Telephony

First, you must determine your purchasing and business function goals. Do you need to replace technology quickly but have very little capital with which to purchase a new system? Do you have a mandate to purchase the system that will have the longest staying power? Are you looking for increased functionality and integration of database and telephone system features for enhanced customer service? Do you have a monthly data/telecommunications budget amount that will remain static over years?

All of the preceding factors should determine your course of action. If you have very little capital, but a solid monthly budget your options are:

- A hybrid system (a system that can use both digital and IP technology) on a short- or long-term lease to assist with lowering the upfront capital cost.

- A “hosted” IP system. This option gives the benefit of a smaller capital purchase. The hosting site is responsible for maintaining, updating and protecting the server because it remains at their office, not yours. However, you pay for each phone seat every month until you replace the system. This could get costly over time. If your organization functions more on bonded projects and is more resistant to increased monthly spending, the lease option may be more appropriate.

If your organization is mandating new technology to enhance customer service, again, you have the same options.

Most manufacturers are developing new technology for their hybrid and full IP systems only. While CISCO, 3 Com, Interactive Intelligence have only been IP systems, Nortel, Avaya (Lucent/AT&T), Toshiba, Mitel, NEC and some others were analog and digital manufacturers that have moved to combination digital/IP platforms that resemble the size and mounting of larger data switches. The combination platforms are smaller and install in a data rack. In some cases, the combination platforms allow an organization to have the best of both worlds: retention of digital phones plus new IP telephones and features where they are needed most. This typically keeps the cost down by mixing and matching technology. At the same time, new features and transport methods are still available, giving increased flexibility in the system design.

Things to Watch For

When you are planning a telephone system upgrade there are many aspects that you’ll want to consider, ranging from infrastructure needs or limitations to buying and leasing terms. Here are a few items to keep in mind.

- **Cable must be CAT5E or even CAT6.** Since the IP Telephony server is just like a data server and the IP telephones are essentially data devices similar to computers, printers and scanners, they require different cable in the walls than the telephone system previously installed. The cable used for data devices has a maximum distance limit of 300 feet from start to finish. Most analog phones and even some digital phones have a distance limitation of up to 1,000 feet. So for some applications the IP telephone would not function without additional considerations.



Meet the Author at the Conference

Julie Drake will speak at the following IAPD/IPRA Annual Conference session

Saturday, January 27,
11:30 am
Plaza A Ballroom
Session 136
Your Call - OPT IN or
OPT OUT of VoIP!

Telecom Terms Made Easy?!

I have been in the telecommunications field for 12 years, and I am still amazed at the amount of acronyms and other industry terms that get thrown around as if everyone – including the client – knows them. In an effort to shine some light on some (certainly not all) terms, I have written this list – with a little humor thrown in, because you just have to laugh!

CSR – In some circles this is simply a ‘customer service representative’ but in telecommunications this is a lengthy report from the phone company showing all of your services and charges. When you first see one, it appears to be written in a foreign language. Do not be alarmed.

DID (Direct Inward Dial) – A method whereby a company can purchase numbers (not lines) from the phone company and give employees private numbers. These are usually transported through a PRI line (see below).

D-Marc – This is the point of entry for the public telephone company into a building. Usually encased in a green box, it may be outside the building, in a basement or in a storage or maintenance room. In a shared building, there most likely will be one common block that each tenant will have to reach with a private wire connection.

DSLAM – Not the best dunk shot from former U of I basketball star Dee Brown, it is a mechanism at a phone company’s main location that links many customers to the public network.

DSL (Digital Subscriber Line) – This is the system used to push high speed data over an existing copper telephone line. ADSL means that there is a different speed for downloads and uploads. SDSL means that the speeds are the same both directions.

E-911 (Enhanced 911 service) – The ability for the 911 operator to track a call to an exact location. For sites under 40,000 square feet, this can be simply the exact street address. For those over 40,000 square feet or in a WAN/MAN setting, the location can be traced to an area or even to a desk.

Firewall – A device that can be programmed to allow or not allow data traffic to move in and out of a private network. It can either be software or hardware. For many businesses, a software only solution is not recommended.

IP Telephony – A system that is fully IP, has a server (either in a traditional phone cabinet, a router or a server) and IP telephone devices that connect to the server through a data switch.

Hosted, IP/IP, Centrex – These terms are interchangeable and refer to the ability of the phone company or other private provider to supply IP phone service and IP phones to a company without installing all of the controlling equipment at the company’s location. This service is a rental service where a client pays for phones or features on a per month basis for the entire life of the contract. This is not an endorsement for this type of service, simply an explanation.

Hybrid – Not to be confused with the gas with corn in it, this is the classification of a phone system that can be programmed as a key system (see below) or as a traditional PBX (see below) or populated with IP functions.

Key System – This is a phone system programmed to show one button on a phone per one line connection from the phone company.

LAN (Local Area Network) – A collection of computers or other devices connected in a single building through the use of hubs or switches.

LOA – Not to be confused with anything Hawaiian, this is simply a ‘letter of authorization’ giving an appointed agent permission (from the customer) to interface, make changes, place orders on the customer’s behalf.

Number Portability – The ability to move your current phone number to another carrier. This can happen currently between cellular carriers providing service in the same regions. However, not all service providers in the local line arena can offer this feature at this time.

PBX – This is a term that refers to a sharing of line resources. On an individual phone, there are no buttons designating individual lines, as with a key system (see above). For this system, you typically dial ‘9’ to make phone calls outside of the building. Many systems today are referred to as IP-PBX systems because they use IP rather than digital or analog technology to drive the main processing.

PRI – A digital line that provides 23 application channels and one signaling channel. The 23 application channels can be shared for voice, data and video applications, depending on the installation. This is commonly used to replace multiple individual phone lines in a business for a streamlined cost.

Port – A spot where the cruise ships dock?! Actually, no. This is an order to move existing phone numbers from those for one telephone line to a PRI (see above) so that a client does not lose existing telephone numbers and still streamlines cost.

POTS Line (Plain Old Telephone Line) – This is a line that runs on a copper cable usually provided by the local telephone company to a home or business.

Presence – This term is used in the area of IP telephony, as well as other data circles such as instant messaging. It is the ability to quickly see the status of a user in a network – phone, data or internet.

PSAP (Public Safety Answering Point) – Many counties house full-time, around-the-clock 911 operators in this location. When a 911 call is routed properly, it goes to the PSAP. Some VoIP line providers cannot provide that service at this time.

T1/DS1 – A 24 channel circuit that comes into a building on a single four-pair copper cable. The total bandwidth of this line is 1.544 Mbps

VoIP (Voice over Internet Protocol) – This takes sound waves and touch tones and converts them to the 1s and 0s used in data transmissions.

WAN/MAN (Wide/Metropolitan Area Network) – A citywide, statewide or countrywide method of connecting smaller LANs with organizations that have multiple sites on the same plot of land.



- **Power – every IP telephone requires power.** You can power each IP phone simply by plugging it into a local outlet on the desk. The problem comes during a power outage. Unlike a digital telephone system, an IP system has distributed power rather than centralized power and requires different planning. To provide centralized power, you can replace existing data switches with newer switches equipped with PoE (Power over Ethernet). This allows for a more centralized management of power backup solutions. Remember to extend power back ups to all switches providing connections for IP telephones, not just those in the main equipment room.

- **QoS (Quality of Service).** Many of us have experienced a conversation with someone in which the person sounded as if he were in a tunnel, or we've had conversations in which the other person's words came out jumbled. All of these traits can result from a network with improper QoS measures. QoS must be programmed into every link on the network. If all communication is in the same building, then all of the data switches connected to IP telephones must be programmed to prioritize voice over data transmissions. If the IP connection goes between buildings and over a public network, then the router, as well as the switches connected to the IP telephone system, must also contain the proper QoS programming. The reason is that voice is a much more precise transmission. A computer file transmission can handle some distortion in line quality (industry terms used are jitter, delay, latency, etc.) and still deliver the data properly on the other end. However, a voice conversation that gets jumbled, delayed or interfered with will not correct itself.

- **Improper bandwidth.** Your voice between locations now travels on the same pipeline as your data. If your data currently needs all of the capacity you have on your data circuit, then your voice will not work properly, even with all of the QoS measures in



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place. Build your network calculating bandwidth use expectations and then add 25 percent more – you will need it.

- **Warranty.** The IP systems are based more on computer hardware and software warranty times, rarely having more than a 90-day free warranty period. This increases the cost of the purchase by mandating that the customer pay for extended warranty packages much earlier.

- **Labor cost.** A vendor selling the CISCO, Interactive Intelligence or 3-Com products typically charges higher hourly costs for its technical staff.

- **Staff.** Does your organization retain staff that oversees the network and the telephone system? If so, how are these two divisions going to mesh together or will one need to be eliminated?

- **Internal and external culture.** Every organization pursuing an IP telephony system must ask itself the following questions: (1) Will our customers scheduling recreation reservations be accepting of poor voice quality at times? (2) Will my board of trustees understand that sometimes the system may not be functioning because the data network or main circuit line is having problems? The answers to those and many other questions alone may well dictate the route your organization should follow with any planned upgrades.

Please note that implementing a full IP Telephony platform is not an evil thing. It is not poor technology. It is just not right for everybody simply because it

is the “in” thing to purchase. IP Telephony can be beneficial to incorporate into a disaster recovery plan, or for connection of data systems, or for customer screen pops to recreation operators, or for quick connection of remote locations and at-home workers. But, when looking at your options, remember that technology for technology sake is never the best option. Further, prior purchase planning is essential to a positive end result.

How One Park District Handled This Issue

Two years ago, the Peoria Park District found itself considering a telephone system upgrade. Two of the main office buildings housed 20-year-old telephone systems. Replacement parts were hard to come by and the system was frequently in disrepair. The district had approval to replace the outdated equipment. The district put the job out for competitive pricing.

On Peoria's list of needs, other than reliable equipment, was the connection of three main buildings. The connection had to be able to facilitate intercom (four-digit) dialing between those three facilities, allow for transfer of calls, be able to share voice mail between the three facilities, retain answering positions in each of the three buildings and allow employees to see a busy light for employees in other buildings. The district also wanted to manage simple programming changes within the organization from a central location and keep a log and costing of all outgoing calls at the three facilities.

Peoria hired an independent consultant who assisted in presenting their needs in an RFP to local vendors.

They had old Category 3 cable in several locations and data switches that were not capable of providing power or quality of service that the IP systems would have required. For this reason, the district requested proposals for hybrid systems with VoIP technology used to connect the three locations. This process resulted in a hybrid system replacement at all three locations and a centralized voice mail system with all required features.

However, it also provided for enhancement of data routers at the three facilities (this was required to maintain QoS between the sites), added a call-queuing software for the main answering positions in three of the main departments and equipped the operator with a cordless phone to allow mobility.

The district had been approached by IP telephony vendors, but when Steve Clore, the system administrator was asked if there were things the district sacrificed to just get the system in, he answered: "Not at all, we were able to expand and integrate our system with functions and features above and beyond our initial expectations due to system functionality and opportunities available."

The district recently proved the flexibility of its choice. Equipment at a remote location in the district began to fail. So, the district replaced the data switch, increased the bandwidth and added IP telephones at this remote location. This solution significantly reduced the capital cost for the new equipment at this remote office, plus it gave the remote location four-digit

dialing to the existing network and access to the centralized voice mail system.

The Telephone Technology Mix That's Right for You is More Important than Being on the Edge

In summary, systems can be positioned with old and new technology alike. In order to achieve organizational goals, it is possible to gain many new features by using systems that can provide both digital and IP telephony technology. When approached about IP lines that will save money or IP telephone equipment that will increase your productivity, just be sure that the technology upgrade that the sales rep is touting will really provide the promised results *for your situation*. Sometimes it will. Other times it won't. The best advice I can give is – educate, educate, educate and plan, plan, plan! ■

Julie Drake is president of Jewel Technology Services, Inc., a company that helps clients make educated telecommunications purchasing decisions. She holds a degree in communications from Southern Illinois University and has been in the telecommunications field for 12 years. You can learn more about Jewel Technology at www.jewelteam.com.

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