

VoIP and IP Telephony Considerations - White Paper

VoIP Overview:

When examining the benefits and advantages of VoIP and IP Telephony, one must have a basic understanding of the technical workings of a traditional phone circuit. In a traditional analog phone circuit, a call is initiated and delivered over a pair of dedicated copper wires from the caller to the called party. This creates a dedicated physical connection for a single call of high quality. This technology is limited, however, in that it can carry only one call at a time over that dedicated pair of copper wires.

VoIP technology, on the other hand, “packetizes” voice signals and converts them into digital data packets. Those data packets are then sent to the network where they are transmitted simultaneously with information data, video, instant messaging and delivered to the appropriate recipient. The same two copper wires discussed in the previous example are now capable of carrying multiple conversations in addition to data traffic on the network.

In addition, the VoIP voice packet can now be transmitted through other communication channels such as cable, Wi-Fi, satellite, etc.

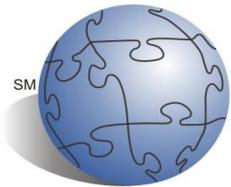
Essentially, the IP packet (data, voice, video) is now independent of a specific communications channel, and can be transmitted on any current communications channel or a future one, taking advantage of new technology developments as they become available.

VoIP Phone Systems:

VoIP Phone Systems have been designed to take advantage of the VoIP packet technology.

This leads to a myriad of benefits derived from such technology such as:

- One cabling system instead of separate wiring for telephones and separate wiring for data and computer networks.
- Web based administration. With a VoIP phone system, system administration functions are performed on a computer, usually through a browser based program, so no more cryptic command lines. A vendor service call (\$) is no longer required to make minor changes to the system such as adding or moving employee extensions. Save your support dollars for the major changes or upgrades.
- Voicemail is usually included at no additional charge. The days of buying voicemail ports are history.
- Unified Messaging and Follow Me. Get phone calls and messages the way you want. It is your option if you want all your voice mails to end up as Outlook email messages or for a phone call to follow you to any alternate phone numbers
- Making and receiving calls. This can be done on a traditional phone handset, through a personal computer or a softphone running on a laptop.
- Routing telephone calls over the Internet avoids long distance phone charges.



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- Peer to Peer phone calls. All calls are Peer to Peer. This is a big advantage over the legacy phone systems. After the call is set up by the VoIP phone system, the voice or video traffic is direct between the two endpoints reducing the traffic congestion at the phone system.
- Remote Users and Multiple Locations. Everyone who is logged into the system is capable of receiving and originating calls. If your employee is at a Starbucks store with Wi-Fi in Seattle and a call comes into the corporate headquarters in Chicago, the call can be directed to the employee in Seattle just as if that person were sitting in Chicago. Use of the corporate communication resources such as voice mail, automated attendant, and email can be centralized simplifying all support and maintenance. You can tie together all your locations and remote users into one virtual phone system.
- Software features and options. There are many features and options available for VoIP phone systems, with many features either included with the system purchase or available at a reasonable charge such as call centers, call accounting, etc.
- VoIP systems can have extensive configuration options to tailor the system to the organization's needs whether financial, healthcare, insurance, manufacturing, etc.
- Industry standards. Many VoIP systems are using industry standards in their system, moving away from the proprietary and limited systems of the past. This trend applies to both the software and hardware involved with the VoIP phone system.

Not all VoIP phone system vendors have adopted the pure VoIP technology and industry standards. Many cling to obsolete and proprietary technology. Each vendor's product needs to be carefully reviewed. Some questions for discussion in making an informed decision:

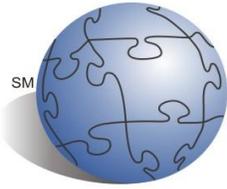
- Is the system a pure VoIP solution?
- Is the foundation phone system software based on an industry standard or is it proprietary?
- Are the phone handsets SIP compliant or is the phone handset technology proprietary to the vendor? (Limited choice for you = \$\$ for the vendor)
- Is the phone system hardware built from standard computer hardware or is it proprietary?
- Can the phone system be expanded within reasonable limits or will you be forced to change hardware or worse software at awkward points? Some vendors have completely different phone systems for different market segments or sizes, making transitions difficult.

VoIP Phone System Implementation:

The crux of any successful VoIP phone system is the implementation. No longer is the phone system a standalone system. Instead it integrates with your computer network and communicates with Outlook email.

Accordingly, the set up of a VoIP phone system is critical. If done with inadequate knowledge and skills, there could be poor voice quality, dropped calls, inferior network performance, and other problems. Some of the issues to consider are:

- Assessing whether the additional traffic from a VoIP system can be handled by the existing network infrastructure including any plans for video conferencing
- Assuring voice traffic priority and quality through careful selection of network components and network configuration
- Establish a regular backup of the phone system's data and configuration



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- Make sure the security of the phone system is set appropriately. After all, you want to guard against persons trying to break in and use the phone system to make free long distance calls or compromise the data on your network.

Typically, the most successful VoIP systems are implemented by network consultants with some legacy phone knowledge as opposed to a legacy phone installer trying to learn networking. The reason is that the technologies involved in a VoIP phone system install and a legacy phone system install are completely different. A VoIP install essentially involves a branch of network technology.

Look for a firm with both network and phone consultants on staff locally if possible. While much of the administration for a VoIP system can be done remotely, sometimes there is no substitute for an onsite presence if the situation warrants it. Some large VoIP resellers have multiple sales locations with no local technical support, and travel time is usually billable.

With careful planning and choice of a quality VoIP phone system vendor, you can have a successful and state of the art VoIP phone system.

Communication Circuits:

The VoIP revolution is altering the balance of power between communication circuit vendors and end user organizations. Remember the days of the little choice, high priced, pay through the nose for those nifty features, long term contracts with penalties for any changes?

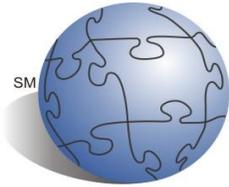
IP packets, including voice, can be routed over any communications circuit available at a location.

For example, phone voice service can be routed over SIP trunks via an Internet connection instead of via traditional phone lines. Many SIP trunk providers require no contract or a short term one – months not years. So if a special project requires five additional phone lines for three months, many SIP trunk providers can accommodate this request and not charge a fortune.

In the past, there may have been only one real choice for phone service. In many cases there are now multiple communication circuit providers for a site and that number will continue to grow. In the long run, organizations will pick the best provider for their needs and benefit from competition among providers in features, support levels, and cost.

Summary:

Technology continues to evolve at an ever-increasing and rapidly-changing rate, and telephony technology is no longer an exception. The progression and advancement of phone technology mirrors that of computers and networking, and the technological advantages of each are now being combined to offer a unified effective and highly efficient business solution. The advantages of this technology are already numerous, and the list will only continue to grow as new applications and interoperabilities are developed.



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While it is always risky to predict future technology developments, the industry consensus that VoIP technology will be **the** choice for phone systems in 5 years or less. Over half of the new lines installed in the U.S. are already based on VoIP technology and that migration will only accelerate.

The driving force behind this revolution in phone technology is quite simple. Organizations that use this technology benefit from increased employee productivity usually at a lower overall cost.

However, one solution does not fit all organizations. To select a good phone system for an organization, the current environment and plans for the future need to be carefully analyzed before any decision is made. With technology, there is never an automatic best answer. It changes too rapidly, and the good solution today may be the obsolete choice in three years.

Definitions:

Softphone = Software only phone handset. Typically runs on personal computers or laptops.

SIP = Session Initiation Protocol. Standard for how devices interface, like a common language.

VoIP = Voice over Internet Protocol. Standard for how voice traffic is transmitted over a computer network.

Wi-Fi = Wireless local area network.