Wireless Voice and Data: One Network Does IT All

A White Paper Prepared by Insight

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Businesses today are retooling their communications networks-for good reason. New technologies are more reliable and easier to manage, enabling greater productivity and constant connectivity. Heading the list of must-haves: wireless communications devices and converged networks with Voice over IP (VoIP) telephony.

There are many mobile workers who must be reachable no matter where they are located. While cell phones are certainly adequate outside facilities, they can provide spotty coverage within buildings and, of course, such calls can be expensive. VoWLAN is a technology that enables calls made to a private branch exchange (PBX) (or IP switch serving in that capacity) to be converted to data format, sent over a wired LAN, and then transferred to a WLAN1. An employee with a Wi-Fi enabled phone is able to receive calls wherever wireless access points are available. Since most large organisations still have PBXs rather than IP switches installed, a communications gateway serves as the "black box" that translates voice signals into IP format.

> *Further, many industry analysts now believe that because an end-to-end IP telephony system is inevitable, there is no reason to delay the adoption of an all-IP infrastructure.*

A Closer Look at Voice Over Wireless LAN (VOWLAN)

Since the cost of any new infrastructure can be significant, the catalyst for change is usually a business event. For example, if a business is planning to move, add locations, or replace an outdated phone system, the switch to VoIP telephony can be done in conjunction with this event. There are also other factors propelling change in the communications infrastructure.

[1] ***Schatt, S.*** *(July 23, 2003). Is It Time to Deploy Voice Over Wireless LANs?*

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- Market researchers InfoTech and Synergy Research report that more than 50 percent of all private branch exchange (PBX) sales by 2005 [are] expected to be IP-based.
- Gartner Group estimates that, by the end of 2007, traditional enterprise telephony-system manufacturers will cease development of traditional systems.
- Further, many industry analysts now believe that because an end-to-end IP telephony system is inevitable, there is no reason to delay the adoption of an all-IP infrastructure.

With traditional PBX equipment being phased out by manufacturers, the costs to support installed systems are expected to rise dramatically in the short term. Already, most new voice network installations are IP-based, reflecting the well-defined trend toward converged solutions. Companies are realising there is no point in buying expensive new equipment with a predicted short life span.

Even businesses that don't have an event-driven change should evaluate their existing phone and data networks to determine whether they meet both short- and long-term needs. For example, do mobile workers need better connectivity? Is the phone system nearing its term? Is the network at maximum capacity? Is cost reduction a primary driver? Are there redundancies in IT and telco management? These are a few of the issues that would merit an evaluation of this technology.

The Rise of VoIP

VoIP or IP telephony is the two-way transmission of voice traffic over your packet-switched TCP/IP data network. Rather than a separate network-like traditional PBX-a VoIP system is another server deployed on your computer network. One set of wires instead of two. This makes it much easier to manage than a traditional phone system. Additional advantages to VoIP over traditional telephony include:

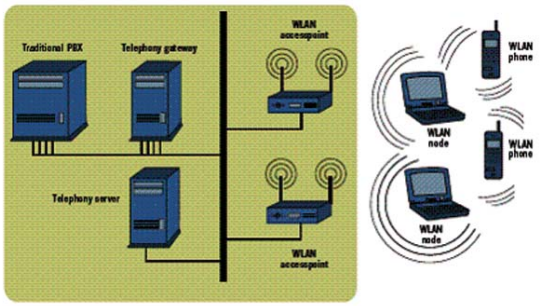
- Lower calling costs, especially for long distance
- Lower infrastructure costs; once the IP infrastructure is installed, additional telephony equipment requirements are minimal
- Long-term investment protection; because VoIP functionality is delivered in software, new features and service enhancements do not require hardware replacement VoIP telephony software is installed directly on the network, and IT managers can set call priorities and manage traffic the same way they do for data.

Because voice traffic is especially sensitive to latency, the network can be configured to ensure that voice traffic gets top priority. VoIP solutions require phones that support industry standard protocols for voice over IP transmission. Analog telephone adaptors (ATAs) can be used to convert the signal from your standard phone to a digital signal for connection to a VoIP network. There are also IP phones that look much like traditional phones, but are VoIP-ready with an RJ-45 Ethernet connector instead of the traditional RJ-11 phone connector.

Computer-to-computer telephony can also be implemented via headsets, speakers and desktops or notebooks, using only software installed on a hard drive. In any case, a VoIP phone gets plugged straight into a LAN port, and the desktop PC gets plugged into the phone. Wireless implementations rely on access points and other equipment to connect voice and data equipment to the network.

Connection to existing PBX systems can be done via a gateway, so that the addition of VoIP solutions does not require a complete replacement of your current technology. This allows for the adoption of VoIP technology in increments to minimise the disruption to the network and spread costs over time.

Adding VOWLAN to an Infrastructure With a Traditional PBX



From Voice Over Wireless LANS, June 2004, Forrester Research2

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VoIP in a Wireless Setting-or VoWLAN

For in-building mobility, a converged voice and data network with wireless technology offers specific benefits. With a VoWLAN (Voice over Wireless LAN), voice and data are served up over a local LAN or even a wireless wide area network (WWAN). Connectivity comes via "cordless" phones and notebooks or PDAs-even something called a Wi-Fi phone is beginning to come into play.

Wireless technology especially benefits businesses and organisations that have a large number of staff roaming around within a building, who require access to common data. Hospitals and other healthcare settings provide a prime example of a highly mobile workforce with a need to communicate and access data while moving around. The same is true for businesses with large campuses or warehouses. As people move about, it's much easier if they don't need to plug into a wired network in each room. Characteristics shared by workers who will most likely benefit from a VoWLAN communications system include:

- High level of mobility, either functioning without a stationary desk, or spending a high percentage of their work time away from the desk (roaming area is within a building, inside a plant or intra-inter campus)
- Need to be instantly reachable with both voice and messaging
- Need for instant access to mission-critical data

The deployment of a VoWLAN-in whole or in part-with your LAN is comparable in cost to the deployment of similar wired networking and communications.

Therefore, cost should not be a deterrent, especially if your business is facing an event that requires an additional networking or communications service. If your business needs mobility within the workplace and you are planning a change in your communications network (due to moves, growth or equipment upgrades), then a converged VoWLAN might provide the best option.

Considering the Challenges

Although there are challenges to configuring a VoWLAN, once it is up and running there is only one network to maintain. Adds/moves/changes are easy to implement, as well, and the added flexibility, increased productivity, lower TCO and enhanced communications capabilities are worthwhile returns.

Some of the technical challenges involved in deploying a VoWLAN solution include cell overlap, RF noise and packet delay. A wireless data network can endure some gaps in coverage and slight delays in packet transmission, as well as signal "noise." Voice traffic is not so forgiving.

Before deploying VoWLAN in the business environment, a comprehensive site survey should be conducted to account for these potential challenges, and a plan developed to mitigate their effects. At a minimum, adjustments in your transmission power or access point locations to ensure adequate coverage and signal processing should be considered.

Concerns about security can be addressed in a VoWLAN as they are with any wireless network. Using encryption/decryption and QoS protocols, voice, data and Internet traffic can be separated on the VoWLAN network to ensure optimum performance and confidentiality. Issues like security, roaming ability, QoS and other "challenges" need to be addressed during the VoWLAN deployment.

A Worthwhile Change

VoWLAN can make employees more reachable when needed and can also enhance productivity by granting access to the business network for your highly mobile workforce. By enabling greater connectivity among employees, decisions can be made without delay and action taken to further business. What's more, using a single converged network for all communications reduces TCO of both networking and communications.

Potential Applications of VoWLAN

When analysing a move to VoWLAN for your business, you may have trouble quantifying the benefits of improved productivity and constant network connectivity. Some possible benefits scenarios might include:

- A hospital patient can receive needed pain medication more quickly because the physician can review the patient's medical chart, research drug interactions and dosing strategies, and order the prescription at bed side for immediate delivery. The wireless communication is delivered in data format-printable-to the in-hospital pharmacy.
- Review real-time parts inventory from your handheld while roaming through a factory floor to minimise gaps in production.

[1] ***Schatt, S.*** *(June 8, 2004). Voice over Wireless LANs - Still Hype, Or Is It Time to Deploy?*

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- Summon a specialist from one side of campus to help diagnose an emergency occurring in another building.
- Monitor building and campus security while roaming.
- Customer support personnel available by phone even when away from their desk.

Case Study: VoWLAN in a Medical Facility

Insight recently implemented a VoWLAN for a mid-sized regional medical center in Florida. With an acute care hospital, rehab facility and wellness center, the entire organisation is spread across 30 acres and several buildings.

The Objective

Like most medical campuses, this center's workforce of nurses, supervisors, doctors, technicians and support staff is highly mobile. These people need to reach one another while constantly roaming around the campus-both within buildings and between facilities.

They also need access to patient records, medical data, laboratory results and other information that is stored on the center's network. Access to the Internet for research and outside communication was also overdue. For this healthcare client, wireless communications presented an opportunity to enhance patient care.

Insight conducted a thorough evaluation of the customer's IT environment and communications requirements. Working closely with the medical center IT staff, Insight developed the following communications plan:

- Install an IP telephony system for the mobile workforce-wireless phones that can be carried around the campus, would facilitate easy communication among staff members.
- Deploy a wireless data network so that doctors and nurses access the network with notebooks and hand helds, enabling them to perform bedside registration, access patient data, order prescriptions, and so forth.
- Enable Internet access for medical staff, as well as patients, their relatives, visitors and guests.

The medical center also required the solution to integrate with existing network and communications infrastructure to balance TCO. New communications services were expected to enhance and extend the performance of the existing environment, not replace it.

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The Solution

The most effective way to meet the stated goals was through a wireless data network outfitted with VoIP telephony (or VoWLAN). Cell phones and wireless data devices can perform similar functions, but the infrastructure needed to support these diverse networks was deemed too cost- and management-intensive.

Insight recommended a converged VoWLAN solution that would enable the medical center to achieve all of the new networking and communications capabilities wirelessly, via a single integrated network.

The amount of new infrastructure required would be kept to a minimum, thereby keeping acquisition and maintenance costs down. To implement the solution, Insight first conducted a site survey to map out the locations for the wireless access points. This process is different than that used in a wireless data network, where the wireless connections can be more forgiving. Insight planned for extra access points to ensure that the temporary loss of one access point would not affect coverage. Because the access points use Power over Ethernet (PoE) switches to provide power over Cat5 Ethernet cable, no external power source was required for the access points.

Insight upgraded some of the facility's multi-layer LAN switch infrastructure, increasing the performance capabilities of the network switching devices to support higher levels of QoS and the VoIP and wireless computing standards. The VoWLAN solution was integrated with the facility's

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existing PBX phone system and data network. Voice gateways were deployed so that the wireless VoIP technology can communicate with the PBX and make outside calls. It all appears seamless to the workforce-just like making traditional phone calls.

Wireless networking, voice traffic and guest Internet access all use different encryption/decryption methods, allowing all types of traffic to communicate securely-and simultaneously-via the single network. Firewalls separate the different kinds of traffic, and quality-of-service (QoS) protocols enable the IT staff to put a priority on VoIP communications.

The deployment of the converged voice and data network offered benefits across the organisation. The most obvious benefit to the hospital staff is greater mobility and accessibility. The wireless Wi-Fi handsets allow nurses, physicians and other staff members to be more accessible and responsive eliminating delays during critical points of care. The wireless IP phones offer additional features and applications such as text messaging. The hospital is also able to reduce costs for campus communications by utilising a single converged network. Finally, the wireless LAN infrastructure provides secure, wireless connection to the Internet-a value-add for patients and their families.

About Insight

As one of the world's largest providers of IT products and services, Insight is on the cutting edge of the trend to VoWLAN, crafting converged voice and data networks for businesses, enterprises and public sector organisations.

As a Cisco Premier Certified Partner , VPN Security Specialisation , SMB Select Partner , Wireless LAN Specialisation with specialisations in a range of technologies including IP Telephony, Security and Voice, Insight is uniquely qualified to plan, design and deploy a customised solution to meet those needs. Insight works with leading suppliers to design and deliver converged network solutions including Voice over Internet protocol (VoIP) and IP Telephony (IPT). We manage all aspects of moving you from your traditional network to a converged network.

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