Revolutionize Your Hospital Communications with VoIP

Quickly and easily contact — and connect with — clinicians for collaborative patient care

Voice over Internet Protocol (VoIP) technology seamlessly routes voice conversations over wireless networks to ensure immediate, real-time connection to highly mobile hospital staff throughout your campus — and beyond. By promoting better, faster communication and collaboration, VoIP can help improve quality of patient care, increase staff productivity and reduce costs.

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Executive Summary

Most hospital staff members are constantly on the move during their shifts. Such mobility makes it difficult to reach them via traditional fixed phone systems, which tend to function as voice message centers rather than two-way communication tools. With VoIP, clinicians can be reached immediately, wherever they are, eliminating the need to waste valuable time tracking people down and waiting for callbacks. VoIP frees medical personnel to provide quality care wherever necessary throughout the hospital, since they no longer need to be tied to a specific workstation to make or receive calls.

VoIP technology enables hospitals to integrate voice, data and video requirements into a single, streamlined, wireless I.T. infrastructure. This supports the movement toward a fully digital healthcare environment where patient records, test results and other key information are instantly accessible throughout the campus or remotely. In addition to improving patient care by enhancing the timeliness and quality of communications, VoIP networks enable videoconferencing, specialist consultations and other collaborative treatment approaches that benefit patients. VoIP also provides a foundation for integrating the latest healthcare I.T. applications, both now and in the future.

An Introduction to VoIP

VoIP systems route voice conversations on a data network, either over the Internet or through any other IP-based network. In many cases, VoIP systems can run on data networks that are already part of a healthcare organization's I.T. infrastructure. VoIP represents the true convergence of voice and data using digital technology versus traditional telephony, where voice and data networks are completely self-contained. And instead of the private branch exchange (PBX) that legacy phone systems use to connect, route and carry calls, servers handle call control and call functionality for VoIP systems.

As a result, VoIP allows providers to manage their phone system like an I.T. system, using a centralized network to inexpensively move, add or change lines as well as enable the latest telemedicine applications for clinicians from teleconferencing to video to wireless integration. A VoIP infrastructure supports better communication and collaboration across a healthcare enterprise both by eliminating piecemeal systems that don't "talk" to each other and by providing instant access to medical personnel. In addition, the components of VoIP systems can be tailored to a variety of user levels — for example, doctors' phones require a different capacity than nurses' station phones — helping clinicians to improve patient response time and quality of care.

Also important to note is that VoIP doesn't necessarily require that a hospital have mobile devices to be effective. There are a variety of stationary IP telephony systems and handsets that can be used with VoIP at various points of care throughout a hospital — at nurses' stations, in doctor's offices or in conference rooms. These voice and data systems are powerful transmitters of VoIP benefits, as discussed on page 3 ("IP Telephony Options Offer Flexibility").

Moving, adding or changing lines with VoIP costs an average of only $8 — a 90% savings over traditional phone systems.

SOURCE: NEMERTES RESEARCH

Industry Trends Driving VoIP Adoption in Healthcare Organizations

As hospitals move toward filmless/paperless digital environments, they focus on integrating the best technology and clinical practices to deliver the highest-quality patient care. Increasingly, I.T. investments and decisions have a growing impact on a hospital's bottom line and ability to stay competitive. In particular, a number of industry trends are driving VoIP adoption. These include:

- **Technology convergence.** Allowing separate technologies to share resources and interact with each other creates new efficiencies. Using VoIP to integrate voice, data and video into one easy-to-manage wireless I.T. infrastructure centralizes application hosting and call processing without sacrificing user experience throughout the hospital. In addition, removing voice from its own channel enables more and better applications. For example, voicemail, e-mail and faxes can be managed from a common inbox; teleconferencing can become a standard desktop and phone feature; and a "presence management" function can be used to detect who is logged on to the network at any given time.
- **Advanced healthcare I.T. applications.** Digitally advanced healthcare operations are increasingly utilizing and relying on I.T. applications such as electronic medical records (EMR), computerized practitioner order entry (CPOE), positive patient identification (PPID) and Picture Archiving and Communications Systems (PACS) to improve patient safety and the quality of care. In a paperless/filmless environment, patient records, lab results and other key information stored electronically can be made accessible via the same network as voice. Shared voice and data networks like VoIP open up new possibilities for converged applications, many of which have yet to be developed.
- **Mobility.** Highly mobile medical personnel continually get caught up in endless rounds of phone tag and communication delays with traditional systems, possibly compromising patient safety. The ability to immediately locate and communicate with clinicians wherever they are enhances their ability to quickly and accurately coordinate patient care, as well as dramatically reduces the risk of medical error.
- **Cost-cutting pressures.** Hospitals — and their I.T. departments — are constantly being pressured to do more with less. Using a single converged network for voice, data and video needs rather than multiple standalone networks reduces operating, maintenance and expansion expenses.

In less than 20 years, the global telephone system will run largely on Internet technology.

SOURCE: *HARVARD BUSINESS REVIEW*, SEPTEMBER 2005

IP Telephony Options Offer Flexibility

A broad range of wireless and stationary IP telephony voice and data devices are available to meet a wide variety of needs. These include:

- **Wireless IP phones.** These portable phones provide connectivity across the hospital campus for doctors, nurses and other clinical staff. They can be programmed with the necessary level of functionality and desired applications.
- **Wearable badges.** Lightweight, mini-VoIP phones can be clipped to lab coats or worn on a lanyard. They are hands-free and voice-activated, and can instantly connect callers to other clinicians and departments, as well as send and receive outside calls.
- **Nurses' station IP phone.** These phones can be integrated into the nurse call system, enabling patients to contact and talk with the nurse on duty. In addition to alert functions, VoIP offers the ability for video screen activation when a patient pushes the nurse call button so that nurses can view patient status before entering the room.
- **Teleconferencing IP phones.** Used in physicians' offices and hospitals, they promote timely, seamless collaboration for optimal patient care.
- **Videoconferencing IP phones.** Used primarily in hospital meeting or conference rooms, they enable remote consultation and collaboration with specialists across the globe.

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Multiple Benefits for Multiple Users

Whether calling a physician across a hospital campus, paging a respiratory therapist or consulting with specialists several states away, hospital communications must keep pace with the demands of today's healthcare environment. Healthcare providers can realize numerous benefits for a variety of users across the enterprise by implementing VoIP. Advantages range from improved communication, collaboration and coordination of care to lower costs and improved return on investment (ROI) over the long term.

Improved Communication, Collaboration and Satisfaction

With a VoIP system, clinicians can be reached instantly whenever needed, wherever they are on the hospital campus, eliminating communication delays that prevent timely diagnosis and treatment. Unique VoIP phone numbers or calling names that follow staff members no matter what VoIP device they are using replace the need for pagers, as well as the need to remember multiple phone numbers. Programming patient alerts directly to VoIP phones also improves response time and enhances patient care. And the ability of a VoIP system to communicate in multiple languages — with translation capabilities most frequently utilized in admissions and the operating room — is another valuable benefit.

While wireless IP phones eliminate the need for clinicians to be tied to a specific workstation, hands-free, voice-activated devices can also be used to instantly connect callers to other clinicians and departments, as well as send and receive outside calls. In addition to promoting collaboration and providing faster communication access, VoIP can provide videoconferencing capabilities for patient consultation and brainstorming. And surgeons can use hands-free VoIP on notebooks or other devices to communicate with specialists outside the operating room.

VoIP contributes to increased clinician satisfaction by enabling medical personnel to reach other hospital staff consistently, easily and quickly, ensuring they have the information they need to deliver quality patient care. Plus, because all new and existing systems are integrated, new VoIP users need to learn only one interface, which minimizes training and encourages speedy adoption.

Easy to Manage and Protect

With VoIP, hospital I.T. staff can manage the phone system like any other I.T. system, via a centralized network. At the same time, the migration of voice, data and video to a single network significantly reduces the complexity of a provider's network infrastructure, resulting in increased flexibility and easier administration. I.T. resources therefore can be redeployed to higher-level projects.

The security of critical patient data, patient privacy issues and compliance with regulatory security requirements are always key concerns for providers. The ability to apply a virtual firewall over the VoIP network protects against "stolen conversations" and stolen patient information. In addition, the use of wireless VoIP phones in lieu of traditional pagers and intercom systems enhances patient privacy.

Greater Opportunities, Lower Costs

Although there are several factors contributing to a positive ROI with VoIP, some hospitals see it first and foremost as a business necessity. In addition to improving the ease and efficiency of hospital-wide communications, VoIP creates a unifying platform for a hospital's growing array of applications that supports more intelligent and efficient communications throughout the enterprise.

As with any phone system, there is an initial capital outlay for installing a VoIP system. Over the short and long term, however, potential cost savings can be reaped in several areas:

- **Reduce investment in multiple network infrastructures,** especially if you plan to replace an existing phone system anyway. In fact, VoIP systems can often run on data networks that are already part of a hospital's I.T. infrastructure.
- **Decrease operating costs** because it is inherently less expensive to manage one network than multiple networks, and VoIP systems cost much less to operate and maintain over time than traditional phone systems. Moving, adding or changing lines costs only a fraction of the fees associated with traditional phone systems. Hardware connection costs can also be lowered significantly and still deliver far more powerful performance. A converged system also reduces the costs associated with integrating new services and applications.
- **Lower system expansion costs** by using a single network and enabling cost-effective scalability to meet increased usage and bandwidth-intensive application demands.
- **Take advantage of "toll bypass."** Phone calls that run over your data network are essentially free calls, whether they are local or long distance.

"The total payback period for VoIP is typically realized within 18 to 24 months for most healthcare organizations."

PAT SCHECKEL, SENIOR DIRECTOR OF PRODUCTS AND SOLUTIONS, CDW BERBEE

Essential Components of an Effective VoIP Solution

Within a healthcare enterprise, each department has its own specialized needs, and hospital professionals — physicians, nurses, lab pathologists, X-ray technicians, respiratory therapists and administrators — also have their specific requirements, work environment and preferred tools. To maximize the effectiveness of a VoIP system, it is critical to build a reliable multipurpose infrastructure that integrates a broad range of devices and applications across departments and disciplines.

Start with a Wireless LAN as Your Foundation

The ability of a VoIP solution to deliver immediate communication access to key personnel — any time, any place — provides its core value. A wireless LAN provides the critical foundation for an effective VoIP system. Because a LAN is platform- and device-independent, as well as relatively inexpensive to install and expand, it offers maximum versatility and scalability. The LAN must have sufficient speed and bandwidth to support VoIP and consistently deliver the desired level of Quality of Service (QoS), whereby voice receives priority over other network traffic.

The U.S. healthcare telecommunications services market is projected to grow at a compounded rate of 5.4%, from $6.3 billion in 2006 to $8.1 billion in 2011. Spending on wireless technology is expected to grow at more than twice the overall rate.

SOURCE: "TELECOMMUNICATIONS, IT, AND HEALTHCARE: WIRELESS NETWORKS, DIGITAL HEALTHCARE AND THE TRANSFORMATION OF US HEALTHCARE 2006–2011," INSIGHT RESEARCH CORPORATION, AUGUST 2006

Powerful IP Network Connections

Equally important is to ensure routers, switches and servers are powerful enough to handle VoIP system demands. Routers must be capable of handling the volume of traffic generated by the VoIP network, and Power over Ethernet (PoE) switches are necessary to enable scalable and manageable power delivery to IP phones, as well as simplify IP telephony deployment. Even hospitals that are not planning to deploy VoIP right away may want to consider refreshing their switching networks to PoE switches as soon as possible, in order to save substantial money when VoIP is eventually implemented.

64% — up from 49% a year earlier — of the healthcare I.T. executives responding to the 2007 HIMSS Leadership Survey ranked high speed networks among the top technologies they intended to implement in the next two years.

SOURCE: 18TH ANNUAL HIMSS LEADERSHIP SURVEY, APRIL 2007

Case Scenario

How VoIP Connects Clinicians, Improves Patient Care

The IP phone at the nurses' station on the cardiology floor rings, indicating the patient in room 402 is requesting a nurse. An available nurse leaves the station to respond, and discovers the patient in significant discomfort and complaining of shortness of breath. Without leaving the room, as she continues to assess the patient's condition, she pushes a button on the granola bar-sized device hanging from a lanyard around her neck, and uses a voice command to open a secure communications link and call the patient's cardiologist. The VoIP system detects his presence on the network, and immediately locates him in an examining room in an adjacent building on the hospital campus. The patient's symptoms ease as the nurse confers with the physician via his wireless IP phone. They decide she should continue to monitor the patient closely and report any changes to the physician immediately.

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Best Practices for Successful VoIP Implementation

To ensure an optimal VoIP solution for your hospital, it is important to select a knowledgeable third-party provider to help you identify, assess and meet your particular needs. The solution provider should have experience with VoIP deployments in hospitals similar in size and scope to your organization, and have expertise not only in VoIP but also in medical-grade networking, security, network infrastructure and wireless.

Before implementing a VoIP solution, it can be helpful to work with your solution provider to create a unified communication roadmap that addresses these key issues:

WLAN capacity. Speed and bandwidth of the existing or upgraded LAN must be sufficient to support VoIP, utilizing T1 lines to connect buildings on your campus.

Quality of Service. QoS refers to the ability to prioritize different types of traffic on an IP network. With VoIP, this means assuring that voice traffic receives a higher level of priority to ensure it will not be delayed or dropped. Consistent QoS standards generally incorporate dedicated bandwidth and focus on controlling jitter (delays that affect the quality of conversation), latency (delays in packet delivery) and packet loss (which contributes to dropped calls). It is also vital to make sure that priority for voice traffic does not cause problems or delivery failure for other types of traffic.

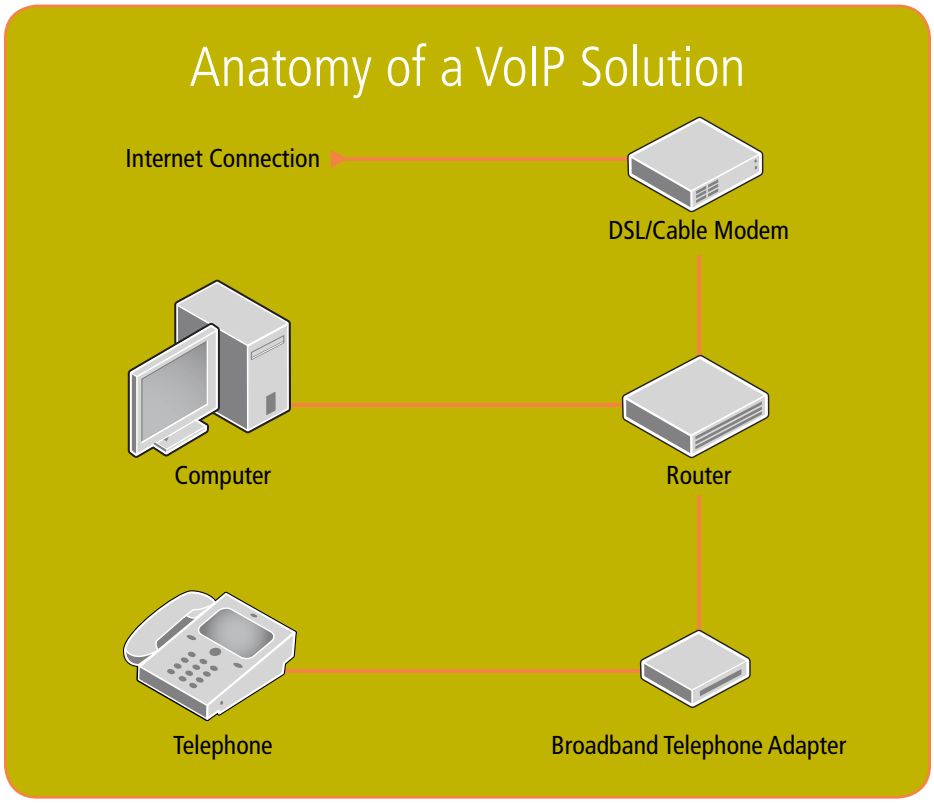
Multicast-enabled. The network infrastructure must be able to support applications that depend on multicast, such as videoconferencing.

Security. The VoIP network must be properly secured to comply with regulatory requirements, assure patient privacy and protect against the possibility of "stolen conversations."

Power. With patient lives hanging in the balance, hospitals have zero tolerance for system failure, especially the inability to communicate. Backup servers and uninterrupted power supply sources are essential for VoIP.

Upgrades. Frequent technological advances in existing VoIP systems mean new upgrades must be implemented in a timely manner to assure continued optimal quality and effectiveness.

Integrated coordination. Your VoIP vendor should work closely not only with your I.T. staff, but also with key administrators such as the Vice President of Operations and the Director of Nursing to ensure the solution meets user needs, has buy-in by clinical staff and can be implemented quickly and smoothly.



A VoIP system utilizes a WLAN to connect a hospital campus. The system is centrally managed via servers as is any other I.T. system. Routers and Power over Ethernet switches connect a host of mobile and stationary IP devices to the network, providing instant, flexible communication access to medical personnel.

Glossary

Multicast-enabled
The VoIP network infrastructure can support applications that depend on multicast, such as videoconferencing.

Power over Ethernet (PoE)
Switches that enable scalable and manageable power delivery to IP phones, as well as simplify IP telephony deployment, in a VoIP system.

Quality of Service (QoS)
The ability to prioritize different types of traffic on an IP network. With VoIP, this means assuring that voice traffic receives a higher level of priority to ensure it will not be delayed or dropped.

Telephony Convergence
Allowing separate technologies to share resources and interact with each other to create new efficiencies; for example, using VoIP technology to integrate voice, data and video needs into a wireless I.T. network.

Voice over Internet Protocol (VoIP)
Technology that routes voice conversations on a data network, either over the Internet or through any other IP-based network.

Wireless Local Area Network (WLAN)
A local area network that uses high-frequency radio waves rather than wires to connect various locations.

How CDW Healthcare Can Help

At CDW Healthcare, we understand the voice and data I.T. needs and resource requirements of hospitals and their campuses. Our knowledge and insights are based on 20 years of experience as a trusted I.T. adviser, delivering technology expertise to more than 10,000 healthcare customers.

An Optimal Fit for Your Needs

We're committed to providing the right VoIP solution for your unique needs, helping to improve communication among physicians, nurses and other staff across your entire campus. We offer VoIP pre-sales design and assessment services, as well as installation services. In addition, CDW Healthcare's technology specialists — who have earned numerous VoIP technology industry certifications including Cisco Sales Expert, Avaya Certified Expert IP Telephone and Shoretel Sales Certification — provide expert resources for infrastructure design, deployment and usage.

Collaboration Made Easy

One call to your dedicated CDW Healthcare account manager affords you access to a team of highly trained specialists prepared to help you choose from among more than 100,000 products and 1000 manufacturers. Our solutions incorporate world-class technology to custom-build the optimal VoIP network infrastructure for your hospital and connect it to the components that best meet the varied communication needs of your staff.

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Call your telephony specialist for a quote.

Product Spotlight

Are you missing calls because you're away from your desk, with your patients? Avaya has a solution.

Avaya 3711 IP DECT Handset

Avaya is introducing a new wireless voice solution for users often classified as "corridor cruisers." These users are frequently away from their desks, but need to have access to the capabilities of their desk phone, wherever they are in the building.

Features include:

- Up to 20 hours of talk time and 200 hours of standby time
- SOS (emergency) key for speed dialing an emergency number
- Speakerphone
- LDAP and TFTP directory access
- WML portal access

CDW 1274012

Intelligent communications enable information exchange for healthcare providers and patients by embedding communication applications into the fabric of the health system.

Avaya 5621 SW IP Telephone

- **Front desk power.** Equipped to manage calls and personalize service
- **Networking.** Get all your locations working together
- **Convergence.** Converge phone and data networks for cost savings and easy administration
- **Messaging.** Manage, retrieve and respond to all messaging remotely, regardless of device or location
- **Patient interaction.** Call handling, call routing and coverage — including self-service options
- **Answer calls right away.** Automated attendant and message services
- **Staff productivity.** Take advantage of time-saving features
- **Conferencing.** Your own conference bridge

CDW 1039018

Learn More

For additional information about designing and deploying a VoIP solution to help you revolutionize the way your hospital communicates, contact your CDW Healthcare account manager, visit CDWHealthcare.com or call 800.500.4239 today.

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