



MERU WIRELESS NETWORKS IN HEALTHCARE
IMPROVING EFFICIENCY AND
EFFECTIVENESS IN PATIENT CARE



HEALTHCARE SNAPSHOT

Hospitals, clinics, and other healthcare organizations face a number of challenges as they seek to continuously improve patient care:

- ❑ **Growing demand for care:** in the developed world, an aging population requires more care-giving resources than ever before. Around the world, healthcare organizations are challenged to maximize the effectiveness of their facilities and staff to meet the demand for care.
- ❑ **Caregiver shortages:** an acute shortage of primary care and nursing providers is expected to become worse. For example, according to the U.S. Department of Health and Human Services, a 12-percent shortage of full-time registered nurses in 2010 is expected to escalate to 29 percent by 2020. At the same time, the *Journal of the American Medical Association* reports a steady decline in the number of U.S. medical student graduates choosing primary care. Increasing efficiency is a primary objective for healthcare providers today.
- ❑ **Rising costs:** costs continue to rise for labor, supplies, medications, medical devices, and other essentials. At the same time, hospitals need to provide advanced medical equipment and treatment protocols to attract patients, specialists, and skilled care-givers. Technology plays an increasingly critical role in improving efficiency and reducing costs.

Mobility is Critical To Quality Care

Today's caregivers work in environments ranging from the patient bedside to nurse's stations, administrative offices, doctor's offices, and other locations both inside and outside of the hospital building. Traditionally, physicians and caregivers have had to share workstations or visit the nurse's station to view patient information. Writing notes and traveling to a workstation to input data wastes time, delays care, and can increase the risk of error associated with data entry errors. To improve efficiency and patient care, healthcare facilities are implementing mobile applications that can deliver access to critical information anywhere. These include applications for:

- ❑ **Treatment:** such as Electronic Healthcare Records (EHR), computerized physician order entry (CPOE), and bar-coded medication management applications.
- ❑ **Collaboration:** such as applications for sharing diagnostic results, delivering lab results, and real-time expert consultation on radiology images.
- ❑ **Mobile voice:** these include voice over IP (VoIP) wireless phones, communication badges, and call systems for instant access to key personnel, such as nurse call systems.
- ❑ **Administration:** such as charge capture, coding and billing, and registration kiosks.
- ❑ **Asset management and location tracking:** these solutions help to locate staff, patients, and medical equipment and to streamline clinical workflow.

Mobile applications have also contributed to an avalanche of wireless devices being used in a healthcare facility. From personal mobile phones and smart phones, to notebook computers, tablet PCs, Workstations on Wheels (WOWs), bar code scanners, telemetry systems,

communication badges, and VoIP handsets—the wireless LAN must be able to deliver applications, data, and voice to everyone who needs it, when and where they need it, on any device. Of course, it must also deliver critical care resources with the voice quality and reliability that is essential in a critical care environment.

SYMPTOMS OF NETWORK PROBLEMS

Although mobility is increasingly mission-critical in healthcare, legacy wireless networks were not designed to meet these needs. As a result, clinicians frequently experience the following problems:

- Dropped voice calls and poor voice quality
- Inability to reliably connect to applications or information
- Wireless assets, such as WOWs and EHR, not being used at the point of care
- Tape markers in hallways designating areas with coverage
- Poor application performance

IT teams face the following issues:

- High volume of complaints
- Continuous need for coverage and channel planning
- Tuning and re-tuning the wireless network
- Significant cost and engineering effort required to scale network for new applications
- Need for multiple staff members and specialized expertise to keep wireless network operating
- High staff, management, and support costs

Choosing the Right Wireless Network

Mobile applications significantly improve staff productivity—if the underlying wireless network is designed to support the demands of mobile voice, interactive, image-intensive, and video applications. Meru completely changes how healthcare organizations view and use wireless. With Meru, healthcare organizations can ensure that physicians and caregivers stay continuously connected throughout the hospital and beyond—with toll-quality voice. Meru virtualized wireless networks support critical mobile applications at the point of care, enabling hospitals to confidently deploy innovative solutions for mobile access to patient records, patient monitoring, dosage verification, voice, and asset tracking. Easy to deploy and simple to manage, they deliver the industry's best user experience and a lower total cost of ownership than legacy wireless LANs.

The Best User Experience Improves Productivity

Meru virtualized wireless networks are designed to support critical mobile "point-of-care" applications better than other wireless networks. Users receive toll-quality voice everywhere, with seamless roaming and no dropped calls. They can also work anywhere in the hospital with instant access to voice, data, and video applications. Regardless of the mobile devices they use, voice and other applications can be delivered with over 99.99 percent reliability, so that they can rely on critical systems at the point of care. In a study of one healthcare organization that deployed a Meru wireless network, Forrester Consulting found that productivity improved with the ability to deliver data and voice directly to caregivers, wherever they are (*Total Economic Impact™ of Meru Networks' Virtualized Wireless LAN Solution*, Forrester Consulting, 1/10).

Reliable High Performance—No Matter What

Meru's unique Virtual Cell™ architecture enables healthcare organizations to use a single wireless network for all voice, data, video and telemetry applications. All access points operate on the same channel. Unlike traditional microcell wireless networks in which every

access point is set to a different channel and client devices often overload the access points, the Meru virtualized wireless network controls client device connectivity to provide seamless mobility. It's also easy to scale capacity—simply layer channels as needed to support high-density deployments and dedicated critical-care applications.

Meru's Air Traffic Control™ technology delivers toll-quality voice calls and high application performance, regardless of the type or number of other devices connected. All devices operate at their highest speeds to deliver wired-like performance for your entire hospital staff.

Built-in Security Helps Enforce Compliance Policies

Meru builds in advanced security measures to help maintain HIPAA compliance. As with most Wi-Fi™-certified systems, Meru provides WPA2/802.1x authentication and encryption for all wireless transmissions to protect data. Meru also supports network vendors' Network Admission Control (NAC) solutions to validate security policy compliance for devices coming onto the network before they gain access to network resources. A per-user, per-application firewall also enables you to centrally enforce security policies and secure access within physical perimeters.

Simple to Deploy and Manage

Meru wireless networks deliver low total cost of ownership because they are so easy to deploy and manage and require fewer components. An entire wireless network can be installed in hours or days with minimal staff. Many Meru customers also easily manage their networks with one person. Once installed, the Meru E(z)RF Application Suite automatically monitors the network and provides real-time reporting that conforms to your policies. Meru E(z)RF Location Manager also lets you accurately locate any Wi-Fi-enabled device from a real-time dashboard—without adding special hardware or software to the tracked equipment. You can improve asset utilization, ensure timely maintenance and calibration, and gain insight into equipment inventory while your staff can focus on more important tasks.

Service Assurance Delivers Peace of Mind

The Meru Wireless Service Assurance program easily and efficiently helps ensure wireless network availability by identifying and alerting you to issues before they affect users. The program includes:

- 99.99 percent Wireless Availability Assurance for clinical applications
- Real-Time Application Services that are designed to deliver toll-grade voice service
- A High-Capacity Infrastructure that typically requires up to 30 percent fewer access points than legacy microcell networks

For every Meru wireless network implementation, our consultative staff works closely with your team to address your organization's unique needs. We will survey your site and conduct a professional services review with your IT staff and application architects to analyze your existing network configuration. We will also identify sources of external interference and performance barriers and evaluate voice handsets and voice applications. With this data we create a baseline assessment to assure compliance and architect your solution to deliver 99.99 percent wireless availability. We also manage solution implementation and can operate and monitor your network to meet Service Level Agreements.

SUPPORTING PARTNER SOLUTIONS

Meru partners with leading providers of healthcare devices and applications to deliver comprehensive healthcare solutions:

Telemetry	Socket Mobile	Security and network admission control
Draeger Medical	WYSE	Bradford Networks
GE Healthcare	Zebra	Impulse
Welch Allyn	Unified messaging and communications	Avenda
Asset tracking/nurse call	Agito Networks	Juniper
Aeroscout	Avaya	Distributed Antenna
Axis	Divitas	Inner Wireless
Ekahau	Fujitsu	MobileAccess
Healthsense	T*Mobile	Terrawave Solutions
Newbury	Voice and video	Automated locking
Mobile devices	AAstra	Assa Abloy
Dell	Ascom	Blue Wave Security
Intermec	Polycom	
Motion Computing	ShoreTel	
Motorola/Symbol	T*Mobile	
Pson/Teklogix	Vocera	

Meru Customer Successes

"Meru's wireless network is ideal for environments like healthcare, where users are constantly mobile and both data and high-quality voice communications are critical to their jobs. By delivering over-the-air quality of service, scalability, predictable performance, and ease of management necessary for pervasive enterprise wireless network deployments, Meru significantly improves operating efficiency and ultimately, the delivery of patient care."

– St John's Hospital

"Two years of experience with our Meru wireless LAN shows it to be just as dependable as our wired network."

– Wake Forest University Baptist Medical Center

"The existing microcell wireless network could not support the growing user demand; changing density requirements and co-channel interference issues required continuous monitoring and readjustment of AP placement, signal strength, and channel selection. With Meru's unique offerings we were able to eliminate the need for costly site surveys and recurring AP configurations, resulting in optimal network performance at a far lower cost."

– Miller School of Medicine, University of Miami

"The Meru wireless LAN was the only one we evaluated that provided the security and reliability that we need. Meru's single channel architecture was the only system that enabled the zero-handoff time necessary for our new communications badges to perform optimally."

– Sun Health



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About Meru Networks | Founded in 2002, Meru Networks provides a virtualized wireless LAN solution that cost-effectively optimizes the enterprise network to deliver the performance, reliability, predictability and operational simplicity of a wired network, with the advantages of mobility. Meru's solution represents an innovative approach to wireless networking that utilizes virtualization technology to create an intelligent and self-monitoring wireless network, and enables enterprises to migrate their business-critical applications from wired networks to wireless networks, and become all-wireless enterprises. Meru's solutions have been adopted in all major industry vertical markets, including Fortune 500 enterprises, healthcare, education, retail, manufacturing, hospitality and government. Meru is headquartered in Sunnyvale, Calif., and has operations in the Americas, Europe, the Middle East and Asia Pacific. For more information, visit www.merunetworks.com or call 408.215.5300.

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