



Executive Summary

Industry

- Healthcare

Environment

- 12 Hospitals
- 175 Clinics
- 5,500 Physicians
- 21,000 Employees

Technology Needs

- Increased throughput to support wireless applications for voice, video and mission-critical medical devices and applications
- Secure and reliable guest network
- Wireless architecture with no single point of failure

Extreme Solution Components

- ExtremeSwitching[™]
- ExtremeCloud[™] IQ
- ExtremeWireless[™]

Results

- Robust and resilient Wi-Fi network supporting hundreds of applications and thousands of devices and users
- Guest network with options for Private Pre-Shared Key authentication
- Secure and scalable wireless solution for HIPAA compliancy options as the organization grows



Memorial Hermann Health System Delivers Secure and Reliable Wireless Network

Memorial Hermann Health System is the largest not-for-profit healthcare system in Texas, operating 12 hospitals and over 175 clinics, as well as numerous specialty programs and services in the Greater Houston area. The 5,500 affiliated physicians and 21,000 employees practice evidence-based medicine with a relentless focus on quality and patient safety, treating more than 1.4 million patients annually. Memorial Hermann Health System has received national awards and recognition, including being ranked one of the nation's Top 5 large health systems by Truven Health for patient safety and quality. From its inception more than 100 years ago, Memorial Hermann Health System continues to evolve to offer the highest level of medical care to its patients, including the greater medical and physician community. Through the Memorial Hermann Health System Physician Network, the organization acts as an Application Service Provider through its Clinical Integration Program, offering a Electronic Medical Record (EMR) solution from eClinicalWorks. Memorial Hermann Health System also provides training and support for implementation, as well as hosting data on its servers. Memorial Hermann Health System offers comprehensive, integrated health solutions that deliver quality benefits. By proudly serving its community for more than 100 years, the organization contributes some \$300 million annually through school-based health centers and other programs.

Challenges

Memorial Hermann Health System performs some of the most cutting-edge medical procedures in the nation, including organ transplants, robotic surgery, top-notch rehabilitation, cardiac and burn patient programs. Critical systems and equipment in hospitals and clinics include wireless infusion pumps, laptops in operating rooms for transplant patients, complete digital imaging,

voice recognition for physician reports, video integration in operating rooms, bar coding medication and supply chain administration, and computerized physician order entry.

In the fall of 2012, Memorial Hermann Health System began evaluating its needs for its wireless infrastructure. The organization mandated a solution that would provide greater throughput to support voice and video, and provide a stable mobility platform for the numerous mission-critical medical devices and equipment that operate wirelessly. The provider had implemented Cisco and Aruba for five years, and the technology lifecycle was up, compelling the healthcare organization to re-evaluate its needs.

The result of its evaluation was the realization a complete upgrade was needed to support modern applications. In addition, the IT team wanted to move away from its legacy controller-based enterprise Wi-Fi solution to more easily manage the growth of the network and avoid having a single point of failure in the network. To date they had been operating with older 802.11g (54Mbps) connectivity, which was a bottleneck waiting to happen, so the organization urgently mandated moving to a new Wi-Fi solution for greater speeds and quality of service. In addition, Memorial Hermann Health System needed a solution that was easy to deploy, especially at remote locations. No single campus is completely wireless, as some employees do not operate wirelessly to comply with security and HIPAA regulations, so a solution that would provide seamless interaction between wired and wireless systems was key.

“When considering a refresh of the entire network, the cost of upgrading controllers alone proved expensive and cost prohibitive. With Extreme, we found an exceptional solution for our wireless network.”

Ty Hall, Network Architecture and Infrastructure Manager, Memorial Hermann Health System

The Solution

Memorial Hermann Health System evaluated several vendors and chose Extreme based on its controller-less solution that provided ease of deployment and superior throughput. To begin its upgrade, the organization decided to first deploy Extreme at TIRR Memorial Hermann Health System Hospital, a national leader in rehabilitation and research. Memorial Hermann Health System used Brocade for its wired infrastructure and Extreme AP330 access points for

its wireless solution. It took special care in mapping out the location of the hundreds of access points at its marquee hospital, placing attention to the layout of the facilities.

Access points are positioned in common areas such as the cafeteria and work rooms, and APs are located in patient rooms in a pattern that allowed for maximum coverage. Since many facilities are not simple square buildings and many activities take place in confined spaces located deep within a facility, it was imperative to select the placement of the APs carefully. All future Extreme deployments are now based on the model of the initial deployment at TIRR Memorial Hermann Health System. Following a successful deployment at TIRR Memorial Hermann, the organization began upgrading to Extreme at its smaller hospitals and a refresh will soon begin at Memorial Hermann Texas Medical Center, its largest campus located in the world-renowned Texas Medical Center, the largest medical center in the world.

Memorial Hermann Health System has also implemented Extreme at its smaller clinics, and utilizes the 3G/4G backhaul support to provide mobile access connectivity. When a new clinic is in the construction and renovation phase, the network is not necessarily the first priority in clinical operations, and so initially Extreme APs are installed and the 3G/4G backhaul capabilities are used so medical professionals can still access the Internet and communicate with patients.

The Results

Across its network on an average day, Memorial Hermann Health System has 11,000 concurrent users and clients, including approximately 5,000 guest users. The healthcare provider has experienced flawless connectivity on the network, essential for its mission-critical operations. Having no single point of failure with Extreme solutions is a relief for network administrators. Memorial Hermann Health System is one of Cerner's largest customers, using multiple medical applications from the health care information technology provider, with most of these applications running on Wi-Fi. The organization relies on a resilient wireless network from Extreme to perform such operations as laboratory management from PathNet, use of laptops in mobile carts to access EMRs, scanning patient arm bands for dispensing medication, and for registering patients on wireless tablets when arriving for treatment.

Memorial Hermann Health System has also successfully used wireless applications from AeroScout to track and manage inventory of medical equipment using RFID, and large Pyxis carts to wirelessly track and manage medication and supplies, such as surgical kits in operating rooms.

Memorial Hermann Health System was able to deploy a secure network from Extreme for HIPPA compliancy, as well as patient privacy and protection. With built-in features in the ExtremeOS and ExtremeCloud IQ, Memorial Hermann Health System could easily manage administration of Citrix-powered internal Web-based applications, prohibiting information to be downloaded onto wireless devices, and thus protecting patient information in case devices were stolen or data was compromised.

Memorial Hermann Health System has found the spectrum analysis feature built into ExtremeOS to be invaluable, automatically detecting interference from non Wi-Fi radio devices such as Bluetooth, microwave ovens and cordless phones. The provider receives real-time spectrum analysis data through the ExtremeCloud IQ interface to pinpoint and target the specific location of the interference. Memorial Hermann Health System has also established a guest network with open access to anyone on the same infrastructure as the secure, private hospital network. A strong selling point for Extreme, this was accomplished using the GRE tunneling feature for guest access, eliminating the need for a separate guest connection for Memorial Hermann Health System. GRE tunneling allows the organization to set a firewall rule on the Extreme APs at the network edge, providing additional security and eliminating the additional configuration a separate VLAN would require. The organization also utilizes WebSense, an Extreme cloud security partner, for additional security to enforce Internet use and security policies for the BYOD guest environment.

Memorial Hermann Health System also plans to utilize enterprise-class features from Extreme like Private Pre-Shared Key (Private PSK) solution. Private PSK is an encryption and authentication solution that will enable Memorial Hermann Health System to assign a unique, revocable key on the guest network to utilize strong encryption and authentication without complexity. This is especially important for physicians and visiting consultants as it will enable a private and secure guest connection allowing physicians and consultants to access private patient information that is stored remotely. Many physicians use personal iPads that are not supported internally, and this will allow them to continue clinical activities in a secure

network environment, with less complexity for network administrators. Memorial Hermann Health System has deployed a mobile device management (MDM) solution as it has seen an influx of mobile devices. TIRR Memorial Hermann uses VOIP healthcare solutions from Voalte, specifically developed for iPhones, and is the primary communications device used to monitor patients, talk and text among medical professionals and deliver broadcast messages. The VOIP phones have become a critical device connected to the wireless network and will expand going forward into additional hospitals and clinics, relying on robust wireless architecture and advanced quality of service features from Extreme. This solution has enabled greater efficiency and time management, often turning around patient rooms faster and ensuring smoother hospital operations.

By the end of the rollout, Memorial Hermann Health System will have over 6,000 Extreme access points, with 800 Extreme access points alone at its Texas Medical Center location. All future clinics will be deployed with Extreme and as any issues arise with current technology from other vendors at existing locations, the wireless infrastructure will be replaced with Extreme. Memorial Hermann Health System is also considering using Extreme BR100 and BR200 branch routers for executives and other IT employees located offsite. They have started the testing phase and plan to deploy the Extreme routers in the next three months.

Technology Drives Patient-Centered Care

“For more than 100 years, Memorial Hermann Health System has focused on advancing health and redefining healthcare. Part of this definition today includes embracing technology as we strive for truly integrated health care. That is why network infrastructure solutions like Extreme not only help us reach our mission, but also have contributed to our evolution from a traditional hospital to a clinically integrated health system,” said Ty Hall, Network Architecture Infrastructure Manager at Memorial Hermann Health System. As Memorial Hermann Health System offers leading-edge diagnostic technologies and treatment, it plans to continue to use Extreme throughout all its mission-critical operations, empowering all employees, caregivers and physicians to ensure patients receive the right care at the right time.



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