Customer Profile

Cisco Helps Antelope Valley Hospital Add Wireless to High-Tech Infrastructure

Background

Located nearly 100 miles east of metropolitan Los Angeles, Antelope Valley Hospital has developed one of the most advanced IT infrastructures of any comparable medical facility in the United States. It is the only acute care facility within a 75-mile radius and, with 300 new patients each day, has the second-busiest emergency room in Southern California, trailing only County USC Medical Center in downtown Los Angeles.

With 355 beds—and another 100 to be added within the next twelve months—Antelope Valley Hospital must continue to expand its technological infrastructure in order to serve the needs of a rapidly growing population.

More than 120 servers and processors support Antelope Valley Hospital's demanding healthcare information system, providing everything from departmental solutions to corporate e-mail and calendaring.

The Challenge

Administrators at Antelope Valley were looking for ways to upgrade the hospital's systems to further improve patient care. Wireless technology offered a number of benefits, according to Ash Shehata, the hospital's director of Information systems and telecommunications.

"One of the primary purposes we decided on wireless is bedside computing," says Shehata. "This will enable providers to go from bed to bed with wireless computers at hand so they can easily look up essential patient data and make entries. This saves valuable time and substantially enhances patient care by allowing caregivers to work face-to-face with their patients rather than having to step out of the room to find a computer that is fixed into position by Ethernet cables. Remaining at the patient's bedside also enhances the overall quality of care we provide."

Another motivation behind the move to wireless was the administration's desire to completely eliminate patient medication errors. Antelope Valley Hospital uses a robot called Friendly Robotic Electronic Druggist (FRED) to takes orders from the hospital information system. FRED fills the order, barcodes it and seals for pick-up by pharmacy technicians.

"Wireless will let us add an additional application in which a nurse can take the medication packet, barcode it to her badge and then barcode it to a badge on the patient's wrist to ensure it's the correct medication for that patient. If there's a problem when the nurse barcodes it, the system will sound an alert. This barcode security step will eliminate 99 percent of all medication errors," Shehata says, "and it's all done wirelessly."

There are other benefits to introducing a wireless system as well, according to Shehata. "There will be significant dollar savings once the program is fully implemented."

The Solution

Administrators decided on Cisco Aironet® 350 Series technology to fill the void in the hospital's high-tech environment.

As the hospital already relies on Cisco routers and switches, adding Cisco Aironet wireless technology to an infrastructure was a logical next step toward helping health-care providers deliver a higher standard of care.

Antelope Valley Hospital chose the Cisco Aironet solution after examining systems available through other vendors. "We already use a number of Cisco products, and the integration of Cisco Aironet with those products certainly reinforces network integrity and reduces any potential points of failure. However, our decision was based less on that than on prudent analyses of all available options. Those analyses suggested that the Cisco Aironet system would deliver greater bandwidth and expandability," Shehata explains.

The Cisco Aironet 350 Series technology provides seventy-three access points, deployed at strategic locations throughout the hospital's six floors. Two workgroup bridges supplement the access points by connecting widely separated areas of the main facility. Mobile computers have been equipped with Cisco Aironet 350 Series client adapters.

Based on direct-sequence-spread spectrum technology and operating in the 2.4 GHz band, Cisco Aironet 350 Series access points, bridges and client adapters provide an Ethernet-like data rate of up to 11 Mbps. They are IEEE 802.11b-compliant and Wi-Fi®-certified for interoperability by the Wireless Ethernet Compatibility Alliance.

The Cisco Aironet 350 Series also provides a critical security solution that Antelope Valley Hospital requires. Hospitals nationwide must begin to comply with new patient confidentiality standards issued by the federal government under the Health Insurance Portability and Accountability Act (HIPAA). These standards mandate high levels of security in data transfer.

"HIPAA is a huge issue for us, much bigger by far than Y2K was," says Shehata. "The security offered by Cisco will give us plenty of options to work with."

The Cisco Aironet 350 Series supports wired equivalent privacy (WEP) keys for encrypting data before it is transmitted. It also supports a centralized security architecture based on the IEEE 802.1x standard for WLANs. This new standard includes centralized, mutual authentication and ensures that every client uses a unique, dynamic WEP key. Cisco supports an 802.1x authentication type called EAP-Cisco Wireless, or LEAP, on all its client adapters.

Shehata says data security at Antelope Valley is both professionally and personally important to him.

"I approach the issue as if it is my own record or transaction that needs to be protected, and I ask, 'Would I want the outside world to see this information?' The answer is 'No,' and the solution is the dynamic encryption provided through LEAP."

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The Future

Shehata expects to implement the wireless LAN for all 2,000 users in the main hospital within the next few months and, eventually, set up a wireless wide area network (WAN). The wireless WAN will connect one major acute care facility with a home health clinic, a business office and several other offices situated outside the main campus.

"On the wide area network, we will use LEAP plus virtual private networks (VPNs) and, to complement this system, we are evaluating additional security products from three third-party providers."

Shehata says the hospital plans to do the same for the LAN. "We are checking into additional security products that will interoperate well with LEAP," Shehata said. "We use RSA tokens as well as BioconX biometric solutions for two-factor authentication in conjunction with the Cisco LEAP and VPN technology to ensure that we as an organization have done our due diligence to protect our patients' data across our networks."

The wireless network is already fully deployed but, preparatory to hospital-wide utilization, Antelope Valley Hospital is running several pilot programs to test the applications of the network.

One program is a pilot test with an application from IDX Systems Corporation, a Vermont-based developer of information technology solutions designed to maximize value in the delivery of healthcare, improve the quality of patient service, enhance medical outcomes, and reduce the costs of care. The electronic medical record application being tested by Antelope Valley provides data wirelessly on everything from patient histories and lab reports to radiology results and pharmacy data.

The pilot is being run among nurses in a 40-bed unit. "To be honest, they are tickled pink by the wireless system," Shehata said. "People are often rather skeptical whenever something new is introduced, and this pilot group presented another wrinkle in that medical charting isn't always uniform—charts might be kept at bedside on one floor and with the charge nurse on another."

But the program is proving to be advantageous to both nurses and patients alike. "None of that has been a problem. In fact, wireless has made chart-keeping more convenient. All the nurses have adopted it very well."

Another pilot may be initiated for the Radiology Department, he stated. "Plus, Information Services (IS) and hospital administration are using the WLAN for e-mail and Web browsing."

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