

# Health System Requires Wireless Reliability, and Cisco Delivers



Virginia Commonwealth University Health System leverages Cisco infrastructure to build wireless network.

## EXECUTIVE SUMMARY

**Customer Name:** Virginia Commonwealth University Health System  
**Industry:** Healthcare  
**Location:** Richmond, VA  
**Number of Employees:** 10,000

### BUSINESS CHALLENGE

- Provide reliable, ubiquitous wireless access to mission-critical EHR systems
- Help enable campuswide deployment of wireless devices from computer on wheels (COWS), Wi-Fi phones, infusion pumps to x-ray machines
- Support BYOD

### NETWORK SOLUTION

- Built wireless network with infrastructure from Cisco and DAS from Black Box/InnerWireless

### BUSINESS RESULTS

- Delivered fully reliable network
- Reduced time to troubleshoot issues
- Supported enormous variety of wireless devices, including consumer devices such as iPads

## Business Challenge

It is easy to discount the fast pace of change these days, but some examples are still striking enough to merit a closer look. Case in point: In 2005, the Virginia Commonwealth University (VCU) Health System, as with many hospitals, did not have wireless at all. The organization simply did not see a need for it. But, by 2012, wireless had become as intrinsic to VCU Health System’s operations as plumbing and electricity.

Greg Johnson, CTO and director of IT technology and engineering services at VCU Health System, along with Bob DeVoy, the network manager, and his team, led the effort to turn on wireless services across the one million square feet of office and medical buildings of the VCU health system. Ranked the number-one hospital in Virginia and one of the best hospitals in the United States by **US News & World Report**, VCU Health System employs approximately 10,000 people and brings in US\$1.4 billion a year in revenue.

When Johnson first joined VCU Health System in 2006, the organization was just starting to deploy wireless. Nurses and doctors sometimes needed computers at the bedside, so IT introduced

computers on wheels (COWs) and a few other mobile wireless devices. But increasingly, interactions with patients required immediate access to a computer or other electronic device. Plus, the floor plan of VCU Health System’s new critical care hospital (CCH), a football-field sized area with patient rooms all around the perimeter, did not support the traditional hub-and-spoke model, with nurses going back and forth from rooms to a centralized nursing station to document what they had done. Clinicians needed to bring their own computing devices with them, so that

they could connect to the hospital's new electronic health records (EHR) application on the spot to check records, note vital signs, and administer medication.

VCU Health System first began offering wireless access for the COWs using Cisco WLAN utilizing discreet deployment of access points but coverage was patchy. VCU Health System needed a wireless backbone that it could count on, and it chose Cisco because it wanted a wireless solution from the market leader, with top-quality products and excellent customer support.

"We could see that wireless was fast becoming a requirement for delivering patient care," says Johnson. "My team and I had to deliver ubiquitous wireless access, with utility-class reliability. Cisco is the only company that we trusted to provide the resilient, robust access that we demand."

"Because we deliver truly reliable wireless and support BYOD, our clinicians are confident that if they try new devices or bring in their own productivity tools, they will work as promised. This, in turn, means that clinicians are always eager to take advantage of the latest wireless tools and applications, and, at the end of the day, this contributes to even better patient care."

— Greg Johnson, CTO and Director of IT Technology & Engineering Services, Virginia Commonwealth University Health System

## Network Solution

Within seven years, VCU Health System went from zero square feet of wireless coverage to more than a million. "All that coverage is necessary, too," says Johnson. "Today, pretty much everything needs wireless. It's essential to our infrastructure." For example, diagnostic tools such as x-rays and ultrasounds are now wireless, allowing VCU Health System's staff to roll diagnostic machines up to the patients' bedsides, minimizing disruption to patients. VCU Health System's wireless network instantaneously transmits results where they need to go, integrating them into the EHR and any other necessary systems. In another example, wireless infusion pumps use the network to communicate with their controlling applications to help ensure that the right amounts of each fluid are being infused into each patient, freeing nurses from having to check frequently.

Employees all over VCU Health System tap into a Cerner EHR system that resides in Kansas City, as well as hundreds of ancillary systems, from pharmacology to radiology to scheduling and financial systems. A team of interface engineers helps ensure that all the systems can communicate, but the first step is getting data to and from the bedside through the wireless network.

When the CCH was built a few years ago, VCU Health System purchased a DAS from Black Box and then worked closely with both Black Box and Cisco to help establish a good relationship. The integrated solution of Black Box DAS and Cisco® 802.11 Access Points works smoothly together. Today, the DAS supports everything from 400 MHz up to 6 GHz bandwidth on Cisco 802.11 networks, and VCU Health System has been so impressed by the reliability of this solution that it is making it the standard across campus.

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VCU Health System's core infrastructure is built on the Cisco Catalyst® 6500 Series Switches, but the organization is upgrading to Cisco Nexus® 7000 switches in the main data center and Nexus 5000 switches in the remote data center. VCU Health System also has Cisco Catalyst 4500 Series Switches, Cisco Catalyst 3750 Series Switches, and Cisco Catalyst 2960 Series Switches in place around campus. Cisco 4400 Series Wireless LAN Controllers and Cisco 1462 Access Points as well as Cisco Aironet® 3500 Series Access Points with CleanAir® technology complete the network and ensure a ubiquitous wireless presence.

## Business Results

### Relying on wireless

Though the DAS makes VCU Health System's environment more complex than many traditional environments with discrete systems, it delivers the reliability that the VCU Health System needs.

"We have zero tolerance for downtime, and wireless is inherently unreliable," says Johnson. "DAS helps ensure the highest level of availability: ubiquitous coverage at a guaranteed level." The combined solution is also a highly manageable system. Johnson has noticed over time that network management has become easier with Cisco's monitoring tools, so his small staff has managed to reduce the amount of time it spends on management.

"One of our Cisco SEs once said that we had one of the most complex networks she'd ever worked with," says Johnson. "The fact that we can manage that with a relatively small staff is a tribute to the efficient and effective toolset that we have, and our partnership with Cisco and its VARs."

### Calling for help

To help make sure staff can respond quickly, VCU Health System uses two types of VoIP nurse call systems: an Ascom wireless phone that supports nurse call and external calls, and wearable Vocera B3000 Communication Badges that communicate at the tap of a button.

"Even the manufacturers of these devices say that these are intended as secondary or tertiary forms of communication, and should not be relied on for critical care," says Johnson. "That just doesn't fly here. Our staff demand that these devices work, and with our Cisco wireless infrastructure in place, they do."

### Supporting BYOD

The BYOD movement is especially strong in the healthcare industry. Looking forward, Johnson sees even more wireless devices coming into VCU Health System's environment, more mobile work practices, and even more demand for wireless capacity.

"The iPad was a game-changer, and an insight into the future," Johnson says. "Suddenly, staff were coming in with a consumer device and demanding we incorporate it into our enterprise system as a mission critical patient care delivery interface." VCU Health System was able to accommodate the new devices, but mobile device management (MDM) becomes complicated when employees buy their own devices and data plans but want to connect to VCU's systems. If the device gets stolen, protected health information (PHI) could be misused or compromised, leading to major regulatory problems. To address these issues, VCU Health System is looking to Cisco Identity Service Engine (ISE) to transition from MDM to mobile applications management: managing VCU Health System's applications or data by pushing out content through an encapsulated bubble. Users will be able to view data and work on it within the VCU Health System's applications, but not copy or email data.

## Delivering dependable wireless

Johnson is still surprised by how quickly wireless has gone from being a nice-to-have novelty to an absolutely essential part of everything that happens at VCU Health System.

### PRODUCT LIST

#### Unified Access

- Cisco Nexus 7000 switches
- Cisco Nexus 5000 switches
- Cisco Catalyst 3750 Series Switches
- Cisco Catalyst 2960 Series Switches
- Cisco 4400 Series Wireless LAN Controllers
- Cisco Aironet 3500 Series Access Points with CleanAir technology
- Cisco Aironet 1262 Series Access Points
- Cisco Aironet 1462 Series Access Points
- Cisco Catalyst 6500 Series Switches
- Cisco Catalyst 4500 Series Switches

“Like most healthcare organizations today, our patient care depends on technology, and most of that technology depends on wireless,” he says. “We don’t even have a fallback of using paper-based procedures any more. If our wireless network went down, we would be able to provide only rudimentary patient care, with very little information to go on.”

The mission-critical nature of the wireless network means it has to deliver complete reliability, and Johnson has come to trust Cisco to deliver. The results that he has seen over the past few years have only strengthened his confidence in Cisco products and support.

“The Cisco products are excellent, and the support team is phenomenal,” says Johnson. “Because we deliver truly reliable

wireless and support BYOD, our clinicians are confident that if they try new devices or bring in their own productivity tools, they will work as promised. This in turn means that clinicians are always eager to take advantage of the latest wireless tools and applications, and, at the end of the day, this contributes to even better patient care.”

## For More Information

To find out more about Cisco Wireless, go to: <http://www.cisco.com/go/wireless>.



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