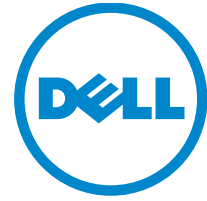


Valley Health eliminates 30-minute wait for cath lab and treats heart attack victims faster using Dell and Intel solutions



- Desktop/Laptop Refresh
- Mobility
- Security
- Virtualization



“Thanks in part to the Dell solution, our patients left the hospital with stronger hearts this year than they did last year.”

Dr. Neal Gaither, Interventional Cardiologist, Valley Health

Customer Profile

Company:	Valley Health
Industry:	Healthcare
Country:	United States
Employees:	4,500
Web:	www.valleyhealthlink.com

Business Need

Valley Health wanted a reliable way to send 12-lead electrocardiogram (EKG) data between ambulances and hospitals so that catheterization labs could be activated in advance of a patient’s arrival to treat patients sooner and minimize muscle damage during a heart attack.

Solution

Enable wireless, two-way transmission of EKG data, electronic health records and other lab tests using an IT architecture based on Dell™ PowerEdge™ servers and Dell Latitude™ tablets and laptops with Intel® vPro™ technology, implemented and managed by Dell partner The Corner Group.



Benefits

- 30-minute wait time for activation of cath lab eliminated
- 50% average ejection fraction threshold achieved
- Hardware troubleshooting and software updates can be performed remotely
- Break-fix in hours or less vs. days or weeks
- Zero hardware failures in ambulances thus far
- Patient consent signatures captured digitally
- Able to accommodate a variety of operating systems on a single device

Healthcare organizations have struggled for years to treat heart attacks faster. The period of time following an acute heart attack during which it is possible to reopen clogged arteries by inflating a tiny balloon at the site of the blockage before the heart is fatally damaged is known as the “golden 90 minutes.” Balloon angioplasty is the most time-critical process in all of medicine—and can cut a patient’s risk of dying by 40 percent.

The so-called “door-to-balloon time” is a measure of the delay that occurs between when a patient arrives at the hospital (door) and when the cath lab team successfully opens the clogged coronary artery, immediately restoring blood flow, oxygen and nutrients to the injured heart muscle (balloon time). Every minute that passes, heart muscle is being damaged. Reducing door-to-balloon times is a major goal for hospitals today, and a directive that has been emphasized in recent years by the American Heart Association and American College of Cardiology.

Getting Information Faster

Some patients drive themselves to the hospital, but those that arrive by ambulance usually receive an electrocardiogram (EKG) administered by an emergency medical technician (EMT), to determine if the heart muscle has been damaged in specific areas. Valley Health, a not-for-profit organization serving the healthcare needs of communities in an area known as the “Top of Virginia,” as well as parts of West Virginia and Maryland, wanted a way to transmit EKG results to the hospital from the ambulance and save precious minutes.

“Our EMTs could do 12-lead EKGs in the ambulance or at the patient’s home, but they had no way to transmit the information back to the hospital,” explains Dr. Jack Potter, medical director of emergency services, Valley Health. “On top of that, more often than not the hospital repeated the EKG when the patient arrived, without looking at the EKG done by the paramedics in the field, because sometimes the tracings weren’t quite as good or for whatever other reason the information wasn’t trusted. This increased door-to-balloon times and had a demoralizing effect on the paramedics who had done what they thought was best for the patient.”

Valley Health had tried different approaches to solving this problem over the years, including radio and fax-based communications. “The quality was so poor that it was difficult to act on the information,” says Potter. But when Potter engaged The Corner Group (www.thecornergroup.com), a Dell partner and IT consultancy based in Marshall, Virginia, to discuss approaches

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Dr. Jack Potter, Medical Director of Emergency Services, Valley Health

Technology at Work

Hardware

Dell™ Latitude™ 2100 netbooks with Intel® Atom™ N270 processors

Dell Latitude E6400 ATG laptops with Intel Core™ 2 Duo processors, Intel vPro™ and Intel VT technology

Dell Latitude XT2 XFR multi-touch tablet PCs with Intel Centrino® 2 processors, Intel vPro and Intel VT technology

Dell PowerEdge™ R610 servers with Intel Xeon® 5500 series processors

Dell PowerEdge 2950 servers with Intel Xeon processors

Dell PowerVault™ MD3000 highly available modular disk storage array

Software

Altiris® Client Management Suite from Symantec

Medtronic Physio-Control LIFENET

Microsoft® Windows Server® 2003

Microsoft Windows® XP

Red Hat Enterprise Linux®

Symantec™ Endpoint Protection 11.0

VMware ESX Server 3.5/4.0

to implementing electronic health records, a better solution began to come into focus.

Turning A Corner

When Potter explained the EKG communication problem to Steve Graves, partner at The Corner Group, Graves rolled up his sleeves to fix the problem. "Steve took it upon himself to work through the different technologies available and put together an end-to-end, managed, hosted solution that would do what we needed without creating more work for our already overburdened IT staff," says Potter.

Graves recommended an architecture based on Dell servers, netbooks and tablets in conjunction with Intel vPro technology to enable bi-directional communication of EKG and other test data between ambulances and hospitals—and allow for real-time, remote hardware management and remediation. The solution also includes a FIPS 140-2 security module that encrypts the information exchanged between the ambulances and hospitals. Valley Health is currently using Medtronic Physio-Control LIFENET to transfer EKG information between the ambulance and the hospital.

Valley Health implemented the wireless 12-lead transmission solution at one of its hospitals, Winchester Medical Center in Winchester, Virginia, using Dell PowerEdge R610 and 2950 servers with Intel Xeon processors and a Dell MD3000 modular disk storage array as the back-end. The servers run VMware ESX Server hypervisor and Microsoft Windows Server 2003 and Red Hat Enterprise Linux guest operating systems.

These servers reside in Winchester Medical's data center, where they (along with the mobile platforms) are managed by The Corner Group. This arrangement allows the hospital's internal staff to focus on their internal systems, and set policies that can be effectively deployed, monitored and remotely enforced on all platforms, whether the computer is located externally or internally within the hospital.

vPro enabled Dell E6400 ATG laptops or vPro enabled Dell Latitude XT2 XFR multi-touch tablet PCs (each equipped with Intel Centrino 2 processors) are used to support the medical/mission related applications in the back of the ambulance.

These mobile platforms, which are remotely managed using Intel vPro technology, are used primarily for various healthcare and event reporting applications, which need high availability. These platforms achieve high availability in part due to vPro remote management, which is used to make sure each platform is secure and ready, enabling Valley Health to better support the primary healthcare mission on a force of nearly 80 ambulances spread across a number of volunteer fire and rescue squads, county EMS units and each of its own 27 VMT transports.

Valley Health subsidiary Valley Medical Transport also selected the lightweight, durable Dell Latitude 2100 with Intel Atom processors to replace the legacy mobile data terminals in the front of Valley Medical Transport vehicles. These computers are now being used primarily for mobile dispatch related and automated vehicle location applications.

Hardware-Based Security And Management

Intel vPro technology was integral to the success of the project because it enables The Corner Group to manage the tablets over a wireless WAN—even when the hardware is turned off or the OS is unresponsive—to quickly diagnose and even fix problems from remote in minutes or hours instead of days or weeks.

"We have these computers running all over the countryside in a 100-mile radius with people that are not IT experts," explains Potter. "We're working with individual fire stations and mom-and-pop operations—good folks that are dedicated to their communities, but in many parts of rural America, this is all volunteer work. There is no organized, municipal structure as soon as you get outside of most metropolitan areas. So we can't count on them being able to diagnose their own IT problems, and they can't afford to have an IT professional coming over to their ambulance shop every other day trying to figure out what's wrong with their laptops. With vPro, The Corner Group can support them all from a fixed location and do it very quickly and cost-effectively."

To push software updates to the tablets from remote, The Corner Group uses Altiris Client Management Suite from Symantec, which also has hooks into

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the vPro stack for hardware-level management. Symantec Endpoint Protection software protects the endpoints from viruses and malware infections.

When Negative Is Positive

The wireless 12-lead EKG project has had a major impact on Winchester Medical Center's ability to treat heart attacks quickly. "Since we started this program, we've seen an overall downward trend in the time it takes to get patients from the front door of our emergency department into a lab that's prepared to fix their vessel," Potter confirms.

Those extra minutes are helping Dr. Neal Gaither, interventional cardiologist at Valley Health, save lives. "Traditionally, we've required that our nursing staff perform an electrocardiogram within five minutes of a patient arriving in the emergency room," he says. "That's what we call 'door-to-EKG time.' But this technology allows us to actually get negative times, since a reliable EKG with good tracings has already been performed in the ambulance and transmitted to us ahead of the patient's arrival. We had a negative 44-minute door-to-EKG time recently, which allowed us to have everybody here and waiting when the patient came through the door. Otherwise we would have had to take an additional 30 minutes to activate the cath lab—with the patient losing heart muscle as time goes along."

The solution has helped Winchester Medical raise patients' average ejection fraction—a measure of the amount of

blood pumped out of the left ventricle with each heartbeat—to the critical threshold of 50 percent. "That means that the force of contraction of the heart has actually improved in the population of patients in the last year compared to the year before," says Gaither. "Thanks in part to the Dell solution, our patients left the hospital with stronger hearts this year than they did last year."

Morale among EMTs has also improved, since they now have a reliable means to transmit EKG data and know that the data will be acted upon to potentially improve outcomes.

Virtual Flexibility

Valley Health has since expanded the solution to include Shenandoah Memorial Hospital, one of its satellite hospitals, this time using semi-rugged Dell Latitude E6400 ATG laptops with Intel Core 2 Duo processors and Intel vPro in the back of the ambulances. Like the Dell XT2 XFR tablets, the E6400 laptops have touch screens and capacitive pens, allowing EMTs to capture patient consent signatures digitally, instead of using paper.

Although the tablets, netbooks and laptops currently run Microsoft Windows XP, they will be able to accommodate future applications that require Microsoft Windows 7, thanks to Intel VT virtualization technology.

"Valley Health now has a scalable solution that can move into the future and support a variety of additional applications," says The Corner Group's

Steve Graves. "Soon we'll be adding other lab testing applications in the back of the ambulance, such as testing blood for troponin levels, as well as more communications features. Using Intel VT, we can ensure that applications that are only supported on Windows XP can be run on the same device as newer Windows operating systems."

Making Technology Fit The Problem

As the first healthcare organization in the country to implement a wireless EKG transmission project of this scope, Valley Health hopes that other hospitals will follow its example and adopt similar solutions to better serve their communities.

"Dell and The Corner Group have been great working partners, and the fact that Dell was an early adopter of Intel vPro technology really put them out in front for this project," concludes Potter. "The hardware gets kicked around in the back of the ambulances quite a lot, and we haven't had any failures. I think both Dell and Intel have been successful in finding ways for their technology to positively impact healthcare, and The Corner Group has been very thoughtful and organized about developing the application to fit the workflow of the medics in the field as well as those of us in the hospital. They've been able to make the technology solution fit the problem."



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