



## Children's Hospital of Pittsburgh of UPMC

World-class pediatric hospital turns to Alcatel-Lucent for its mission-critical network infrastructure



## CUSTOMER AT A GLANCE

Children's Hospital of Pittsburgh of UPMC

www.chp.edu

Industry: Healthcare

## CHALLENGES

- Improve patient care and outcomes.
- Standardize and refine clinician workflows to allow clinicians to work efficiently and free them up to spend as much time as possible with patients and their families.
- Implement state-of-the-art network infrastructure for both voice and data communications.
- Ensure comprehensive wireless coverage in all care venues.
- Create a stress-free and comforting environment for patients.
- Create a 'quiet' campus with reduced noise levels.
- Create a 'greener' campus by ensuring a paperless environment.

## Alcatel-Lucent provides network infrastructure for world-class patient care

Children's Hospital of Pittsburgh of UPMC (Children's) is one of the top pediatric, research, and medical education facilities in the US. When it opened its new state-of-the-art campus, it turned to Alcatel-Lucent to supply an advanced voice, data, and wireless network infrastructure that would support the hospital's goals for care and research at the new campus.

In May, 2009, Children's Hospital officially opened its new, ten-acre campus in Pittsburgh's Lawrenceville neighborhood. Jacque Dailey, CIO at Children's, says the hospital had high ambitions for the new campus, aiming to set a benchmark for quality care built on some key goals. These include: improving patient care and outcomes; standardizing and refining clinician workflows to allow clinicians to work efficiently and to free them up to spend as much time as possible with patients and their families; creating a stress-free and comforting environment for patients; ensuring a 'quiet' campus with reduced noise levels; and bringing about a 'green' campus.

## IP-based infrastructure provides reliable, secure, wireless access, wherever, whenever

Children's is a leading provider of pediatric care, renowned for its outstanding clinical services, research programs, and medical education. Its patients make more than one million visits to Children's main campus, its neighborhood locations, and

its community pediatrics practices each year - including more than 65,000 visits annually to its emergency department, 13,000 inpatient stays, and 23,000 surgeries. Ranked among the top eight pediatric hospitals in the US, Children's is also among the top ten recipients of research awards from the National Institutes of Health.

The hospital is one of 20 within the UPMC group - one of the leading non-profit healthcare providers in the United States. A critical strategy for delivering the best possible patient care has been the implementation of HIMSS Stage 7, enabled from day-one by the hospital's network. The Healthcare Information and Management Systems Society (HIMSS) published its 'Electronic Medical Record Adoption Model' in 2005- Stage 7 is the pinnacle stage of a paperless healthcare environment, where paper charts are no longer used to deliver patient care.

"One of the fundamental building blocks for anything we were going to do on the campus was the infrastructure for both voice and data communications," explains Jacque Dailey. "The network is the backbone for all electronic health records, call systems, security systems, communication systems, building automation systems, and biomedical equipment - as well as systems for researchers in our state-of-the-art research center, which houses around 30 NIH-funded scientific research labs and our administrative staff. We wanted to be able to treat the infrastructure like a utility, knowing we would have reliable, secure, wireless access, wherever and whenever we need it."



Dailey says that meant, “at every point of the design, we were asking tough questions about quality of service and redundancy, because not only did the network in its primary configuration have to work, but there had to be redundant routes in the event of a switch failure or electrical outage. We also have to deal with the fact that many patient records, including imaging, are very voluminous, because those patients are very complex cases and have been with us for a long time. We needed extraordinary performance as well as availability from the network in order to pull records to the desktop in a timely manner.”

## Alcatel-Lucent delivers state-of-the-art network infrastructure

To deliver a network with such demanding requirements, Children’s turned to Alcatel-Lucent, which has been providing infrastructure support to UPMC for more than six years. “Alcatel-Lucent was introduced to the project as the latest in the game of any of our key partners,” Dailey points out. “However, they handled the challenge of meeting our deadlines very well. They were able to create a design for the campus based on an Alcatel-Lucent infrastructure in record time, and were very competent in local recruiting and training adequate numbers of staff to get the cabling and server implementation, network validation, and final testing done. They also went through a certification process with every one of our application vendors – more than a hundred – in less than a couple of months in order to get all our applications up on the network. When there were any issues, Alcatel-Lucent addressed them quickly and completely, and the way they partnered with us was extremely positive. I have no regrets, about having selected them and about relying on them to implement at this level of complexity, especially during such a complex and busy time.”

The Alcatel-Lucent Voice over Internet Protocol (VoIP) network – based on a pair of Alcatel-Lucent OmniPCX™ Enterprise communications servers – that has now been implemented, connects users and systems in five buildings on the new campus, and links through UPMC’s Metropolitan Optical Backbone to Children’s offsite data center, which houses most of its applications.

## SOLUTION

- IP Telephony Solutions
  - Alcatel-Lucent OmniPCX™ Enterprise Communications Server.
  - Alcatel-Lucent 8 Series IP Touch™ Extended Edition Telephones.
- Contact Center
  - Alcatel-Lucent OmniTouch™ Contact Center – Standard Edition.
- Data Network Solutions
  - Alcatel-Lucent OmniSwitch™ 9000.
  - Alcatel-Lucent OmniSwitch™ 9700.
  - Alcatel-Lucent OmniSwitch™ 6850.
  - Alcatel-Lucent OmniAccess™ WLAN wireless LAN switch.
  - Alcatel-Lucent OmniAccess™ WLAN wireless access point.
  - Alcatel-Lucent 7750 Service Router SR1s.
- Network Management Solutions
  - Alcatel-Lucent OmniVista™ 4760 Network Management System.
  - Alcatel-Lucent OmniVista™ 2500/2700 Network Management System.
  - Alcatel-Lucent OmniAccess™ WLAN [Management Solution].
  - Alcatel-Lucent OmniVista™ Mobility Manager.
  - Alcatel-Lucent VitalQIP™ DNS/DHCP IP Management Software.
- Mobility Solutions
  - Alcatel-Lucent OmniAccess™ Wireless LAN.
- Unified Communications Solutions.
  - Alcatel-Lucent OmniTouch™ My Teamwork.

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With 400 miles of cabling in the 296-bed main hospital alone, and 2,000 wireless access points, the network provides access for more than 4,000 computers, including mobile monitor carts, and allows alerts and monitoring of patient vitals to be sent directly to nurses' wireless phones. The network routes all voice and paging calls directly to wireless devices, virtually eliminating these from the public address system, thus making the hospital a quieter, less stressful environment. It also includes a medical Virtual Local Area Network (VLAN) for medical equipment such as Magnetic Resonance Imaging (MRI) scanners, but otherwise acts as a single network, managed by a single team, carrying traffic for all other equipment over the same network.

## Electronic health records improve workflow and reduce costs

The key application running on the network is the hospital's electronic health record (e-record), which is available across all venues of care, from the emergency department, ambulatory clinics, and inpatient areas at the main campus to satellite locations in the surrounding area, allowing staff to work the same way no matter where they are. Children's had already rolled out most of these components at its former Oakland campus, so staff would be used to the workflows in the new campus, but the Alcatel-Lucent network provides a comprehensive wireless coverage in all care venues that has allowed Children's to take e-records to the next

level. Children's was the first pediatric hospital in the US to achieve Stage 7 recognition – the highest level – from HIMSS Analytics for its electronic medical record, and has been recognized by KLAS, an independent health care research organization, as the number one pediatric hospital in its use of healthcare IT.

Children's has gained several benefits from being able to take use of e-records to the next level, as Dailey explains. “We have been able to reduce our records management footprint on this campus substantially, because we're no longer storing paper records anywhere anymore. We're able to use that space to open another revenue-producing department, and we've been able to move staff that were filing and transporting charts to other roles. We've also eliminated the cost of long-term storage – in pediatrics, you have to store records for a further seven years past the time the child turns 18 and becomes old enough to request his or her own records – and this has also eliminated the very high cost of bringing those records back if a child returns to our campus for additional services.”

## Clinical care quality improvements

On the clinical care side, Dailey says the applications and technologies supported by the network are allowing Children's to deliver a range of quality improvements. “Because staff have access to the information that they need in order



to make the next decision about each child's care, we're able to move more quickly for that child and family, and we're safeguarded from making a potential mistake at the bedside," she points out. "The [Alcatel-Lucent] network is supporting us to move in the right direction in areas such as reducing medication errors, improving communication, shortening lengths of stay, managing outpatient work, and improving continuity of care by knowing a child's history in an emergency situation."

The network is also supporting improved workflow and access to systems in Children's research center. "Many of those researchers are providing patient care, so they're going back and forth between the hospital, the faculty building, and the research building. We provide them with a reliable service from wherever they are on the campus, or even wherever they are in the world, to whatever resources they need to get to in their labs," Dailey says.

Finally the network supports administrative systems for both physicians in the campus' Faculty Pavilion and administrative staff working in the administrative building. "We really do work online the majority of the time," Dailey says. "Paper files and big file storage units were not moved to the new campus, and we're managing our paper flows through online workflows and storage of appropriate files online as well."

All of this is possible, Dailey says, because Children's is able to "rely on the network to be a utility to our clinicians, researchers, and administrators. They're able to do their work knowing they can rely on its performance and availability. We don't have to wonder if it will support things, or if the wireless connectivity will be there; we just continue to add applications and equipment, almost without a second glance. That really helps us advance care in the organization."

## BENEFITS

- Support for HIMSS Stage 7.
- The network connects users and systems across the campus and across departments.
- Paging calls eliminated from public address announcements.
- Reliable, secure, wireless access wherever and whenever it's needed.
- Reduced records management footprint and slashed storage costs.
- Electronic health record is available across all venues of care.
- Staff have access to the information they need to make the best decisions about each child's care.
- Reduction in medication errors and improved communication and workflow.
- Simplified network management.
- Improved flexibility for equipment use and staff communications.

## Future developments

The hospital is now focused on developing support for the ambulatory side of its operations, where its business is growing rapidly. “We’re doing work both on this campus and to extend our services to further geographies in West Pennsylvania and bordering states,” Dailey explains. “We’re looking at providing access to specialists in pediatrics via telemedicine, and to host clinics in some of our partner adult hospitals. All of that work is very reliant on the network being available.” Dailey adds that Children’s is also looking at using all the data it has been able to acquire through moving to a paperless environment to help improve care. “We can use that data to identify areas for further improvements in workflow and efficiencies, and to identify areas for research projects for our researchers.”

As the hospital moves forward, the network will continue to play a key role. “We will carry on doing projects that are very much dependent on the success of the network that supports them,” Dailey says. “Because of the state-of-the-art network infrastructure we have in place from Alcatel-Lucent, we don’t need to consider additional infrastructure to do those things.”

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