A Major US Hospital Utilizes NETSCOUT to Isolate Life-Critical DHCP Connectivity Issue in Minutes

nGeniusONE Service Assurance Platform Helps Major Health Care Provider Deliver Life-Giving Neonatal Medical Services

Customer Profile

The Cleveland Clinic is a nonprofit health care operation, offering a complete array of medical services from cardiology to urology and every specialty in between. In 2014 alone, the Cleveland Clinic had over 5.1 million patient visits with patients coming from all 50 states and over 100 countries. US News & World Report confirmed its status as a well-regarded, multi-specialty medical institution in America, ranking it fourth in the nation with nine of its medical specialties ranking in the top five and six placing in the top two.

While its base of operations is in Cleveland, Ohio with many full-service family health centers scattered throughout the state of Ohio, it also has over 200 locations across the United States and Canada with hospitals in Toronto, West Palm Beach, Florida, Las Vegas – even as far away as Abu Dhabi in the United Arab Emirates.

Lastly, the Cleveland Clinic is not just a hospital system. Cleveland Clinic innovations have spun off over 60 companies, and have secured over 525 patents (it also has over 2,500 patent applications pending).

Business Challenge

Cleveland Clinic Network Operations Manager Dave Hines had a real problem – the Vocera badges used for intra-caregiver communications were not being recognized in the hospital’s neonatal clinic where responsiveness can literally mean saving a life.

In order to facilitate the inherent necessity of instant communication between doctors, nurses, and other critical caregivers, Hines had overseen the installation of a client/server network protocol called Dynamic Host Configuration Protocol (DHCP), which allows for automatic – and dynamic – IP connectivity and roaming privileges. The benefit is that it gives caregivers instant...
communication through the Vocera badge. Essentially if DHCP is not used, IP addresses for new computers or devices that are moved from one subnet to another must be manually configured, but with DHCP, the process is automated. The DHCP server provides a pool of IP addresses, leasing an address to any DHCP-enabled client when it initializes. This is where the problem was – the Vocera badges were not getting on the network properly.

These communication badges are mission critical to the Cleveland Clinic neonatal clinic. The three-inch long oblong, voice-operated device provides easy person-to-person communication over the network. When working properly, the caregiver activates their badge with the push of a button and is then prompted by the “genie,” which is the voice interface to the server. Cleveland Clinic’s neonatal clinic has over 8,000 genies a day with the average call lasting 30-35 seconds. By using simple voice commands, Vocera instantly connects a caregiver to another caregiver while providing complete mobility, a tremendous boon to nurses and doctors. It has a built-in speaker, microphone and radio functionality while providing hands-free operation, which of course, is critical for a nurse or doctor when attending to a sick infant.

In a business environment where communication is a necessity, non-connectivity, while troublesome, is generally not life threatening. But to a neonatal caregiver it is. In the particular hospital where the problem originated, the clinic delivers up to 100 babies a month – and the Vocera communication badges weren’t working. The impact of this technological snafu was immediately apparent. Casual observers of hospital-focused television programs may be familiar with the term “Code Blue,” which denotes a medical emergency. In the neonatal clinic, they use the term “Code Pink” meaning a baby needs immediate medical attention. When working properly, the caregiver would hit the badge and broadcast to other caregivers in the area Code Pink and the room number, but due to the inoperability of the badges, the nurse has to stop attending to the baby, go to a standard wall set and make the code call to the operator who in turn forwards the message out. The end result is that the critically ill infant doesn’t receive the immediate medical care it needs to survive. The malfunction was potentially threatening lives.

Hines and his team sprang to action. The Cleveland Clinic enterprise network is vast with over 48TB of wide area network (WAN) traffic per day and 18TB per day of Internet traffic. If that weren’t significant enough, its data center distribution through its NFS/ SMB Windows® and Linux® servers surpasses 200TB daily. With 165,000 active ports, the Cleveland Clinic enterprise network has as its cornerstone seven Cisco ONS 15454 Multiservice Provisioning Platform, which combines multiple network elements including voice, video and data solutions, and an AT&T DWDM (Dense Wave Division Multiplexing) optical technology overlaying its existing fiber optic backbone.

In addition, the network cloud includes seven main components including the Cleveland Clinic Administrative Campus (CCAC), the Brecksville data center, the main campus, the Parker location, and three remote WANs. Hines used several toolsets to verify the wireless environment making sure there were no dead zones as well as analyzing peaks of interference that could potentially impact the association of the tags. Hines and his staff analyzed network statistics as well and even escalated the connectivity issue with Vocera, but they were unable to detect anything from their logs.

**NETSCOUT Solution**

After considering a number of options, Hines turned to an engineer that was working on the issue and commented,

“Hey, why don’t you use that new NETSCOUT ‘thingy’ and see what it can tell us.”

Hines wasn’t as familiar with NETSCOUT’s nGeniusONE Service Assurance platform solution as it was a new addition to his arsenal of network and application performance management tools designed to help oversee a vast and increasingly complex enterprise network. In fact, it was only a week before that its implementation had been finalized. What was the result? The assistant fired it up and within five clicks of the mouse – without ever having used the tool before – found what turned out to be the smoking gun.

The riddle of the Vocera badge non-connectivity was resolved. But how did Hines and his engineer actually isolate the problem so quickly? That goes back to the essential core competency the nGeniusONE Service Assurance platform provides. The converging of both network and application performance management empowers network operations professionals to receive comprehensive service visibility across not only application tiers and end-to-end networks, but also diverse user devices where relevant as well.
Human ROI

The unending focus of return on investment (ROI) is understandable for profit and non-profit enterprises must maintain financial solvency. However, it is rare when the resolution of a technical issue has a direct – and immediate – impact upon human life, and that is what happened with the successful identification of the Vocera connectivity issue using the NETSCOUT nGeniusONE solution.

Upon restoring the connectivity of the Vocera badges throughout the neonatal clinic, critical care for ill newborn babies was immediately enhanced due to the instant communication between caregivers that is so utterly indispensable.

To know that the successful resolution of the Vocera badge problem would literally facilitate and expedite the saving of a child’s life is not lost on Dave Hines.

“Our mission or value proposition at the Cleveland Clinic is ‘Patients First’ and we all take that very seriously – including us non-health care professionals.”

Hines and his staff continue to use this technology after it was helpful with the Vocera connectivity issue. Says Hines, “We have solved problems using the tool. So, the ROI to me is that I can restore service to the caregivers much quicker who in turn directly impact the health and survival of sick patients – and I get those man hours back so I can devote those to other projects and not to fight fires.”

“On a practical level, Cleveland Clinic was able to utilize the nGeniusONE solution to diagnose the DHCP issue. From nGeniusONE’s service dashboard, Hines’ engineer went into the application service monitor, went one level deeper into the session analysis and then went to the deep-dive packet analysis with the packet decode. There, the DHCP and Vocera badge connectivity problem was identified in, as Hines says, “five clicks” of the mouse. In the packet decode, Hines says, “There were a large amount of errors prior to the optics that we applied that were immediately visible.”

Since the crisis of the Vocera badge connectivity issue, is the tool still one of Cleveland Clinic’s network management tools? “It’s one of the tools we use, yes,” says Hines. “We use it when we receive calls on network performance issues. We look at application performance issues, too.”

As the Cleveland Clinic found, nGeniusONE provides an integrated and consistent set of analytics and real-time views of specific network environment elements thus affording improved communication – and problem isolation – due to its Adaptive Session Intelligence™ 2.0 (ASI) technology. That technology is a tour de force next-generation Deep Packet Inspection (DPI) engine that gives detailed richness of packet-flow data, which in turn bestows real-time contextual analysis of daily service and network and application performance. By utilizing the inherent scalability, depth and speed of ASI 2.0, nGeniusONE can deliver a literal end-to-end visibility into the performance of massive enterprise-wide services both minuscule and prominent covering the entire application, and network and service-delivery modalities.