

CASE STUDY | METRO HEALTH

COMPLETING THE PUZZLE FOR ROAMING USERS IN HEALTH CARE

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AT A GLANCE

CUSTOMER PROFILE

Company: Metro Health

Industry: Healthcare

Location: Grand Rapids, Michigan

Size: 4,500 Active Directory users

SUMMARY

- > Regional healthcare provider with 15 locations in and around Grand Rapids, Michigan
 - > About eight years ago, technological challenges with remote data access led the CIO to envision a system that would fully support users roaming within and between locations and being able to store all health records electronically
 - > Since then Metro Health has been aggressively developing a fully-integrated VDI architecture while pioneering advances in both remote access and electronic medical record technologies
 - > Currently testing NVIDIA GRID K1 technology and planning to begin rolling it out to all 4,500 users
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SOFTWARE

Key Applications: Epic, VMware View, general clinical, office and browsing applications

Desktop and Application Remoting: VMware Horizon View with vSGA, Windows XP and 7

Hypervisor: VMWare ESX

HARDWARE

GRID boards: K1

Servers: HP ProLiant DL380 with one NVIDIA K1 Grid card and one Teradici Apex card per server

Clients: Various desktop, mobile, thin and zero clients

Metro Health is an integrated healthcare system that offers expert, award-winning care from 15 locations in Grand Rapids, Michigan and surrounding areas. Their facilities include Metro Health Hospital, a 208-bed facility that offers general acute care and osteopathic teaching, and physician/outpatient offices located throughout West Michigan. Services offered include nationally-recognized heart & vascular services, various inpatient and outpatient specialty services, a cancer center, and a wellness and community education program. Metro Health also partners with other healthcare providers, a medical education program, and more.

CHALLENGE

Doctors, nurses, and other professional users routinely roam within the hospital and between locations as part of carrying out their duties. These users require fast, reliable access to their applications and data from anywhere within the Metro Health network in order to enter information, view studies, and perform other related tasks.

“Eight years ago, users were tied to their individual workstations,” explained Aivars Apsite, Technology Strategist for Metro Health.

“Roaming users resorted to sharing credentials and logging into other users’ workstations to access their applications. Most of the time, they would remember to use their own credentials... but not always. In response, Bill Lewkowski, our CIO, came up with this crazy-sounding idea back then to implement a Virtual Desktop Infrastructure (VDI) that would allow a roaming user to access their own desktop with their own credentials from any endpoint within 10 seconds.

“Nothing like that existed at the time, but one of our datacenter engineers, Matt Bouwens, rose to the challenge. He developed a browser-based VDI solution that was written, tested, and rolled out within about eight months. Along with that, he pioneered the concept of location-based user roaming back to an active electronic health record system running in a VDI environment.”

This in-house solution worked but did not offer a full virtual desktop because of the inherent limitations of both the browser-based interface



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Aivars Apsite
Technology Strategist
Metro Health

5 REASONS FOR GRID

- 1 Next step in evolution toward delivering full VDI for all users.
- 2 Ability to support multiple high-definition displays per user.
- 3 Flexibility to handle both general office and specialized imaging applications.
- 4 Support for zero clients and BYOD.
- 5 Increasing ROI beyond what has been achieved so far.

and the Remote Desktop Protocol (RDP). Nevertheless, adoption rates soared because users were able to log in securely from any PC and pick up where they left off, running their clinical applications and standard office applications.

“Our initial solution only supported Internet Explorer on a Windows PC, but many of our doctors use Macintosh computers,” continued Apsite. “When VMware 4.6 came out with Mac support, we made the switch. From there, we went on to develop the first Epic View client to allow the same user to maintain their session and keep working from endpoint to endpoint. At first Epic didn’t believe us, but after seeing what we were doing, they took the ball and ran with it.”

Despite these advances, none of the available solutions could offload graphics processing from the CPU. Even basic work, such as playing back videos in a browser or viewing still or moving images within Epic requires GPU calls that were being handled by the server CPUs, which slowed down under heavy usage conditions. The end goal of replacing CPU usage with a GPU when appropriate remained elusive.

SOLUTION

Open Systems Technology (OST) is a reseller focusing on the healthcare industry that Inc. 5,000 has listed as one of the fastest-growing private companies every year since 2007. Brent Sundbergh, Senior Account Executive at OST, has a very strong relationship with Metro Health and worked closely with HP while Metro Health was evaluating the HP ProLiant servers against other platforms throughout November and December of 2013.

The superiority of the HP solution combined with their proactive engagement during the evaluation drove Metro Health to select the ProLiant servers. Together with OST Senior Solutions Architect Aaron Nienhuis, OST worked closely with both HP and NVIDIA to help deliver the DL380P G8 servers with NVIDIA GRID K1 cards when Metro first



adopted the HP platform. Thanks to this high degree of teamwork, Metro Health was the first customer to receive NVIDIA GRID card preinstalled in HP servers.

“Last fall, we put together a new VDI solution spec to address our VDI performance issues, which included a requirement to improve overall graphics performance. HP instead proposed implementing NVIDIA GRID K1 on an all rack-mounted server solution as a better solution,” said Apsite.

“We deployed DL380s running dual 10-core Ivy Bridge CPUs with one Teradici Apex card and one NVIDIA GRID K1 card per server with SSD hard drives on our 3PAR storage back-end. Currently, we are running a pilot with about 95 users and are evaluating how we will roll out NVIDIA GRID to our entire base of about 4,500 users. Keep in mind that we are not trying to solve graphics performance for any particular application; rather, we are trying to solve for roaming users needing fast access and seamless performance on any device, including some users with multiple high-definition displays.”

Metro Health is currently evaluating how well NVIDIA GRID technology satisfies their goal of offloading GPU processing from the CPU for every application that makes GPU calls, and will be conducting testing to determine both how many requests are being made and how NVIDIA GRID is responding to those requests. Server density is a key metric; increasing the number of users per server will save money and add to the bottom line. The current deployment is running VMware ESX 5.5 and



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Epic View 5.3 to deliver desktop environments that are mostly Windows XP, although some Windows 7 desktops are rolling out. Windows 7 will become the standard once testing is completed towards the end of 2014.

So far, the 95 users participating in the NVIDIA GRID evaluation have responded very positively, with only two significant issues: First, a few high-end users are currently using three or more high-definition monitors and will not be happy at having to go down to two monitors, an issue that requires upgrading to ESX 6.0 to solve. The other main issue is that one of the imaging applications used by the Radiology department requires RDP, which is not supported by NVIDIA GRID technology. Currently, RDP is being forcibly disabled for these users; however, the ultimate goal is to have every specialty that relies on imaging using NVIDIA GRID technology to deliver the graphics.

“Part of our success with implementing VDI is that we do not provide static virtual sessions,” explained Apsite. “Each user is assigned to a pool of sessions, which required us to implement shared graphics management with vSGA. As part of this solution, we only use a single desktop image. We deploy icons to the desktop using Novell ZenWorks and AD group assignments, along with ProfileUnity from LiquidwareLabs to capture and restore specific user application settings. This enables the IT department to manage that one image, which makes managing the a whole VDI environment a lot simpler for us.”

RESULTS

The first homegrown iteration of the Metro Health VDI was driven by the forward-thinking vision of the CIO. This initial rollout required a significant effort to educate both the end users and company leadership; however, the stunning success of this initial rollout—despite the technological limitations of the time—quickly saw senior executives, such as the President and Chief Medical Officer, becoming the main champions and evangelists for the new technology. This allowed the IT department

to focus on the details of implementation, testing, and rollout under the leadership of the CIO.

“It’s important to recognize that this story is not entirely one about a traditional problem and solution,” Apsite pointed out. “Rather, it is mainly about a CIO recognizing where technology was going and how it could benefit our patients, and making the commitment to push Metro Health toward the leading edge of what was possible and beyond, thus carrying on our tradition of innovation and leadership in delivering top-quality healthcare.”

The current VDI implementation has been proven through internal and external analysis to be delivering a time savings of 30 minutes per day to each doctor and 50 minutes per day to nurses and other professionals at Metro Health through fast roaming access alone. Meanwhile, service call volume to the IT department have remained flat while the total number of endpoints has grown by 35%. In all, the analysis indicated an annual ROI to Metro Health of 9.3 person-months and \$2 million.

At present, Metro Health is running approximately 50-75 users per server and is testing to see how much of the load NVIDIA GRID is offloading from the CPUs to determine how many users they can support on a per-server basis, especially as the Radiology, Cardiology, and other graphics-intensive departments begin migrating to GRID.

“We are continuing to evaluate NVIDIA GRID technology to see how it pays off for use by pulling GPU calls off the CPU,” said Apsite. “We will see an immediate ROI if GRID performs well enough to allow us to start shutting down servers. My biggest question right now is finding out just how much I can squeeze out of every server and where GRID fits into that answer. Right now, we are beginning our tests with the more graphics-intensive departments and seeing how well that works. It’s a little soon to tell, but so far the results are very promising.”

“NVIDIA GRID technology marks a turning point in our evolution toward delivering a virtual desktop to every user at Metro Health,” Apsite concluded. “I am pleased to say that we are well on our way to truly fulfilling the vision that Bill Lewkowski had almost eight years ago. We’ve relied on the dedication and innovation of our IT personnel plus a bit of luck and sheer boldfaced bravado to get where we are to date, and it looks like NVIDIA GRID may well be the final piece of the puzzle that we need to finish achieving the original vision of our CIO.”

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