

White Paper



Virtualization for Military Healthcare

The New Rx for Patient Information Access

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Introduction

In an ideal world, military healthcare professionals anywhere – stateside or deployed with units across the globe, stationed onboard any ship, assigned to any hospital or on the battlefield -- would be able to access a service member’s medical record with authentication and a few keystrokes.

In an ideal world, clinicians would be free to use any computer to access medical information. They could switch rapidly from one computer to another within the system for greater flexibility, convenience and increased time spent with the patient.

In addition to increasing clinician efficiency, the ideal solution would solve other challenges. It would simplify IT administration, overcome bandwidth issues in remote locations, and protect confidential patient information in compliance with the Healthcare Information Portability and Accountability Act (HIPAA).

There is a proven technology that can deliver all these benefits – and more – to Department of Defense healthcare teams. That technology is Application Virtualization.

President Obama has called for the implementation of all electronic health records (EHRs) and electronic medical records (EMRs) within five years. The U.S. military is already supporting that goal by providing the Military Health System (MHS) with digital access to healthcare information using AHLTA, the world’s largest EHR database. By consulting comprehensive, consolidated digital records for Uniformed Services members, retirees and their families, MHS providers can improve decision making and quality of care. However, achieving fast, simple and secure access to AHLTA can be a challenge, especially when geography, mobility and connectivity raise barriers.

Application virtualization is already in use in a number of DoD commands, U.S. government agencies and thousands of corporations worldwide. In a nutshell, application virtualization centralizes application processing and administration in the datacenter and delivers a virtual image of the application over the network. Healthcare providers and other application users work with this virtual image as if the application were running on their local computer.

The high-level benefits of this approach stem from centralization. Application virtualization facilitates administration and enhances security, reduces bandwidth consumption for higher performance over the network, and improves ease of use. By using application virtualization to manage and deliver the AHLTA EHR application, military organizations can provide medical personnel fast, secure, flexible, and uncomplicated access to the information they need to provide the best care.

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Challenges of Information Access in the Military Health System

Beyond information access challenges shared with civilian healthcare providers, such as time constraints, mobility of staff, and limited IT budgets, MHS organizations face greater issues. The nature of military operations makes it even more difficult to reliably and consistently deliver AHLTA using traditional client/server architecture.

First, the client/server model requires the installation, configuration and management of software on each computer. MHS units' high mobility and deployment to remote areas can cause delays in maintaining and upgrading this software. Second, it may be very difficult to obtain technical support in the field. Third, client/server architecture sends significant amounts of data from the server to the end-user device. At sea or in locations with limited bandwidth capacity, AHLTA performance may be significantly reduced.

Even for stateside hospitals and clinics, the client/server approach can be problematic. One of the main issues is complexity. Standard desktops require a time-consuming login process that is repeated many times over the course of a day when mobile staff members move from one computer to another.

For example, Maj. Bill Sorrells, Group Practice Manager of the 3rd Medical Group at Elmendorf Air Force Base in Alaska, said it was taking an average of 2.5 minutes to get ready for each patient encounter due to the time required for network and application login. "In many cases, this delay forced medical technicians to take notes on paper, hoping to document them later in AHLTA. Often times the provider was ready to proceed with the appointment, but the medical technician had not finished their work due to log in/out delays."

Moreover, different machines may present different interfaces, requiring the doctor or nurse to make the mental switch to an unfamiliar view of the information. All of this complexity takes precious time away from patient care and can be frustrating for staff members.

When the AHLTA client software is installed on local computers, security and compliance issues can escalate. The loss or theft of a device can put sensitive information at risk and impact HIPAA compliance. Similarly, if a clinician must rush away from an AHLTA session without time to do a full logout, the next user has access to that information.

This approach also restricts the ability of clinicians to work from home or other locations outside the MHS facility because of the challenge of installing and securing AHLTA on home computers. Without remote access, off-duty clinicians may be required to come on base every time there is a treatment question or consultation request.

Similarly, IT staff may have to be on site to provide support. At Naval Hospital Camp Lejeune in North Carolina, CIO Genice Beightol explained that her IT team would periodically get calls at home from doctors who were locked out of AHLTA. An IT staff member would have to drive to the hospital, sometimes in the middle of the night, to assist the doctor. This situation required 24-hour, on-call coverage and contributed to delays in treatment.

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Force Base, Alaska

In addition, traditional deployment of AHLTA can mean a heavy administrative burden and a costly cycle of computer upgrades. Maintaining software on each computer workstation can be extremely time-consuming. This is particularly true for a large and powerful solution like AHLTA that involves frequent patches and upgrades. As the application is upgraded, hardware must be replaced periodically to support the newest version.

Delivering AHLTA as an On-demand Service with Application Virtualization

Recognizing the many drawbacks of application deployment to the desktop, a number of MHS organizations have adopted application virtualization technology for delivery of AHLTA to remote, mobile and local personnel. Instead of physically installing applications on individual computers, application virtualization delivers them as a service over the network – available securely whenever and wherever they are needed.

Application virtualization separates application processing from the user interface. The application is installed and maintained on servers within the secure confines of the datacenter. It executes entirely on the server, while the interface is transmitted over the network to the user's computer. The clinician or staff member works with the application as if it were running locally (i.e., through desktop icons or the start menu), making this process transparent. Application virtualization is ideal for delivering client/server applications because it eliminates the complexities of deploying, managing, updating and securing software on each user's computer.

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Highlights of application virtualization include:

- **Flexible access:** Applications can be delivered to any device, over any network and in any location. This makes it ideal for clinicians moving around the hospital or clinic and for deployed units moving from one location to another.
- **Built-in security:** Applications are delivered without the need for pushing actual data or software to the desktop. Instead, they remain securely in the datacenter. This is particularly valuable for remote access by mobile staff and for other organizations outside the local network.
- **Consistent user experience:** Even when switching from one computer to another, healthcare personnel enjoy a consistent experience with AHLTA. This saves time and improves satisfaction.
- **Cost savings:** Because only the application interface is delivered to the device, it is not necessary to upgrade hardware routinely to support the latest software. Older machines and many different operating platforms are supported. Furthermore, centralized administration can significantly reduce IT time and effort.
- **High performance:** Application virtualization requires only a small amount of bandwidth, helping to ensure fast performance, even when users are connecting from remote areas or over older networks.

Accelera Solutions and Citrix XenApp, Platinum Edition: Leadership in Application Virtualization

Accelera Solutions, an award-winning technology consulting firm based in Falls Church, Virginia, is playing a leading role in the successful adoption of application virtualization in Military Health System organizations. Accelera Solutions was the first company to use application virtualization technology from Citrix Systems, Inc., to deliver AHLTA.

“As a leading virtualization provider, we quickly identified the exceptional value of application virtualization for EHR delivery and developed a solution specifically for the healthcare industry. Our solution has been implemented by a number of MHS organizations, including the Pacific Air Forces command, for flexible, fast, and cost-effective delivery of AHLTA to medical personnel,” noted Joe Brown, President, Accelera Solutions.

Citrix XenApp from Citrix Systems delivers virtualized applications as a service. Citrix is not only the global leader in application virtualization, but has a 20-year history of proven remote access performance for thousands of customers worldwide. XenApp is a cost-effective, secure, low-bandwidth solution. Furthermore, the Platinum Edition offers a number of features that are particularly valuable for AHLTA users.

For clinicians and staff at military hospitals and clinics who move from one workstation to another, XenApp simplifies and speeds up secure access to AHLTA and other password-protected applications.

- SmoothRoaming enables virtualized applications to follow roaming users seamlessly. When a doctor or nurse moves from one shared workstation to another using SmoothRoaming, the individual can resume work on AHLTA or another application exactly where they left off. All this happens automatically and instantly.
- HotDesktop speeds up the pace of healthcare delivery by enabling users to log on and off a workstation in seconds, not minutes. Performance tests show a reduction in logon time of as much as 90 percent. Healthcare staff can gain access very quickly using their CAC and PIN number instead of using a full logon procedure.
- Single sign-on capability simplifies authentication to more than one password-protected application. It allows personnel to log on once, using their CAC and PIN, and receive access to all applications delivered with XenApp. Single sign-on improves security by avoiding breaches that can occur when staff members try to remember multiple passwords.

Using a Citrix application virtualization solution designed and implemented by Accelera Solutions, 3rd Medical Group at Elmendorf Air Force Base has sped up access to AHLTA significantly. Maj. Sorrells stated, “The roaming session feature allows users to keep the same active sessions when they move from one client device to another client device. For example, instead of logging into AHLTA for every scheduled appointment, a provider logs in once and accesses their single session many times throughout the day.” According to Maj. Sorrells, all that is required is the CAC and PIN. The clinician logs in to a workstation and uses the applications supplied. When it is time to see the next patient, the CAC is removed and inserted in the next workstation together with the PIN.

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— Maj. Sorrells

“With SmoothRoaming, it takes only 30 seconds to access the network, with AHLTA immediately available, right where the provider or technician left off. Two minutes may not sound like much, but when you have 18 providers seeing 20 patients per day, that is 2,880 hours per year the clinicians aren’t waiting for medical applications to load.”

For the Pacific Air Forces command, the Accelera Clinical Desktop featuring Citrix XenApp is accelerating AHLTA logins and logouts by 90 percent. In addition to faster user switching, clinicians can use a convenient, common kiosk environment. The Clinical Desktop improves productivity, reduces software maintenance costs and increases the useful life of client devices.

For remote users, such as doctors connecting from a home office or while traveling, or personnel at a command outside MHS, who need access to AHLTA, XenApp provides strong data security and compliance as well as improved performance over the network. The solution also makes it fast and easy to provide remote access compared to local installation of AHLTA software.

- SSL VPN connectivity protects confidential data by providing high performance, standards-based encrypted transmissions. Access control policies permit access only by authorized users connecting from devices that meet specific criteria defined by the organization.
- A consistent user experience is a key benefit of virtualized applications. Users enjoy the same look and feel as installed applications, regardless of the type of device – even including thin-client devices. Users always get the latest application updates and application conflicts are eliminated.
- High performance over the network compared to client/server architecture makes virtualization the best choice for remote users. Because XenApp transmits only screen updates, mouse clicks and keystrokes between the server and the user’s computer, minimal bandwidth is sufficient.
- Flexible access: XenApp offers several ways to connect remotely, including via WAN and Internet, and supports practically any kind of computer running a wide variety of operating systems.

For example, a large Navy hospital on the East Coast needed to make AHLTA available to a non-MHS command that processes personnel for deployment. In the existing client/server model the application would have had to be loaded onto local devices. However, high costs made this approach impractical. Accelera Solutions implemented a XenApp application virtualization solution to deliver AHLTA remotely to the other command. There was no need for local installation of the AHLTA client software, and the application performed well over the network. The hospital also used XenApp to provide remote access for doctors working at home or while traveling, as well as for outside contractors such as medical transcriptionists.

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Advantages of Application Virtualization

Application virtualization with Citrix XenApp offers important benefits to any MHS organization, including clinicians, support staff, and IT administrators. First, application virtualization supports the primary mission of providing high-quality care and patient safety by giving clinicians more time to spend with patients and faster access to the data required to make informed decisions. With fast, simple authentication to AHLTA, and the ability to resume work precisely where they stopped on the last workstation, doctors and nurses can focus on the patient, not on the logon/logoff process. In today's fast-paced military healthcare environment, XenApp technology can raise productivity, efficiency, and accuracy.

Second, the technology streamlines remote access to AHLTA while ensuring a consistent experience, whether personnel are deployed at sea or abroad, working from home or on temporary duty. Users do not need to worry about having a certain type of computer or network connectivity or using a special authentication procedure. With XenApp, AHLTA can be delivered via satellite, wireless network, or dedicated WAN. It can be accessed on a laptop, handheld tablet, thin-client device, Cart on Wheels, or traditional desktop terminal.

Security and HIPAA compliance are other advantages of application virtualization, which builds in protection across the system. Applications and data remain in the datacenter, behind the firewall, instead of being installed on devices that are at risk for loss or theft. The small amount of information sent over the network is encrypted using SSL VPN technology. Fast yet secure logon procedures avoid the risks of shared workstations. XenApp features, such as SmartAuditor for automatic session recording and centralized password management, support compliance with HIPAA regulations.

For the IT team, application virtualization can mean reduced costs and administration, better tools for monitoring and managing applications, and peace of mind from stronger security and control.

For example, at Naval Hospital Camp Lejeune, Genice Beightol's team relies on a XenApp solution, provided by Accelera Solutions, for efficient, centralized management and troubleshooting of AHLTA and other applications. "Because my team can access the XenApp environment remotely and resolve issues in minutes, we have been able to eliminate 24-hour/seven-day on-site support. The technician on call can handle issues from home. We find the Citrix technology a Godsend."

Doing more with existing staff is just one aspect of the potential cost savings from application virtualization. Support for any computer or operating platform helps lengthen the time between hardware refreshes. High performance over limited bandwidth can avoid costly network upgrades. Of course, one of the most dramatic cost benefits comes from centrally installing, configuring, updating, and patching AHLTA on the server instead of having to visit each desktop.

In addition, the centralized application performance monitoring capability of XenApp gives IT administrators the tools to oversee performance at the user session level. They can spot potential issues before they escalate, or avoid issues altogether.

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Lejeune

Finally, the advantages of application virtualization can be expanded beyond AHLTA to other MHS applications, from Picture Archiving and Communication (PACS) software to specialized solutions. As more applications are virtualized, the time, cost and effort of IT administration are further reduced.

Conclusion

With renewed emphasis on the implementation of electronic medical records across the US healthcare system, it is more important than ever to ensure fast, secure delivery of EHRs to the clinicians who need them. The MHS is leading the nation in this effort. However, the nature of its mission can make the full adoption of AHLTA – particularly for remote users – a major challenge. With Citrix application virtualization technology implemented by Accelera Solutions, these challenges can be easily overcome. Citrix XenApp not only simplifies and accelerates delivery of AHLTA and other healthcare applications, but also provides major benefits for clinicians and staff, the IT team, and the command as a whole.

Overview of Accelera Solutions

Accelera Solutions, a Platinum Citrix Solution Advisor, specializes in the implementation of desktop, server, application and other virtualization solutions. Accelera was named Citrix U.S. Partner of the Year for 2008 and Citrix Federal Partner of the Year for 2006, 2007 and 2008. Accelera has a solid track record in DoD healthcare. The company deployed a Citrix solution to access the AHLTA software externally for the Navy Medical Center Portsmouth. They also architected a solution for Space and Naval Warfare Systems Center (SPAWAR) Charleston to build and design a solution for remote users of AHLTA. This template is now being tested at several hospitals including the Naval Hospital Charleston. It will be replicated at more than 40 TRICARE facilities in the coming months.

Learn more about Accelera Solutions, an 8(a) company, at www.accelerasolutions.com.