Server-Side Rendering (SSR) on the Exa® Platform Reduces Bandwidth Usage and Increases Productivity

Study Shows Exa Platform Reduces 65% of Average Bandwidth Usage*

In today's digital world, hospitals are struggling to keep up with increasing imaging demands, while managing IT networks that are strained to the limit. Many organizations have already deeply invested in their networks and IT infrastructure, leading administrators to seek out new ways to manage the surge in large imaging file sizes.

The Exa Enterprise Imaging platform from Konica Minolta Healthcare is a first-of-its-kind, breakthrough solution that preserves an existing investment in imaging and information technology, as well as network and IT infrastructure, while enhancing radiologists' efficiency and productivity. It includes PACS, RIS, Enterprise Imaging and specialty viewers that can be used as an integrated solution or individually. The Exa Platform dwells within a facility's existing software installations, further enhancing an organization's return on investment.

Server-Side Rendering

Server-Side Rendering (SSR) allows immediate access to even the largest file sizes with no pre-fetching required. The Exa System employs SSR for fast access to large files, such as 3D mammography studies, echocardiograms and nuclear cardiac exams, including prior studies. SSR provides cybersecurity benefits where no data is transferred to or stored on workstations, minimizing unwanted exposure to patient data.

All rendering and processing occurs on the server, not the workstation, and removes the need to pre-fetch or plan ahead with routing rules. This eliminates the need to download images, which reduces radiology-related network traffic, and significantly increases exam opening speed.

At Assured Imaging, the leading provider of mobile digital mammography in the United States with a footprint covering more than 600 locations across eight states, the Exa Platform and SSR connects imaging sites with radiologists regardless of location. Joe Shafe, COO, says "The Exa Platform has worked better for us because we have so many radiologists who read remotely. The Exa Software has helped us create a platform that lets mobile, portable and brick and mortar sites work together seamlessly."

Konica Minolta Healthcare specifically developed the Exa Platform with SSR to help hospital networks cope with the influx of large file sizes, paired with increasing imaging demands. "Most medical facilities have their IT departments manage the radiology software. We supplement this with a solution that improves workflow and saves facilities money," said Kevin Borden, VP of Product, Konica Minolta Healthcare, HCIT.

SSR technology also plays a fundamental role in positioning healthcare facilities, and in particular imaging departments, for the ever-evolving needs of the future. "The Exa Platform allows our healthcare specialists to deliver a broad array of high-value solutions designed to support improved patient outcomes and provider efficiency," said Kevin Kern, Senior Vice President, Business Intelligence Solutions and Product Planning, Konica Minolta. "Thousands of healthcare organizations rely on us for the security, efficiency, innovation, and quality that will bring our clients into the future of healthcare."

Single Integrated Database

Server-Side Rendering

Zero Footprint Viewer

Cybersecurity
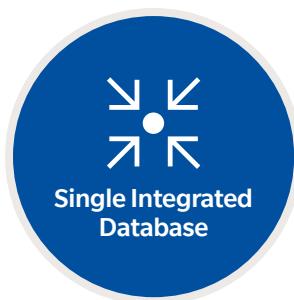
To Upgrade or not to Upgrade?

Advanced imaging technologies and large file sizes put an outsized burden on hospital IT networks. Add to that increased reliance on teleradiology, and networks are pushed to the limit. As a result, many facilities are faced with the need to upgrade network capabilities and infrastructure – a potentially expensive and time-consuming investment they might not be ready or able to make.

For example, digital breast tomosynthesis (DBT) is an evolution in digital mammography systems, with initial clinical evidence indicating a higher cancer detection rate, particularly in women with dense breasts, and a lower false-positive recall rate. However, the large file size of DBT exams presents implementation challenges and can place a strain on existing networks and IT infrastructure.

On average, one uncompressed DBT study is approximately 1.5 GB – nearly 10x the size of a conventional 2D mammography exam and significantly larger than a typical CT exam of the pelvis, abdomen or chest. This large file size places an immediate strain on the network and IT infrastructure, resulting in lag time that can directly impact a physician's reading capabilities, productivity and potentially the facility's financial bottom line.

In all modalities, downloading prior and current studies poses challenges. It requires more local storage and can consume network bandwidth, slowing down the transfer of the studies and other tasks being performed by radiologists and technologists. If the prior study is not pre-fetched, it can take several minutes to load, further straining the network speed and bandwidth.

Radiologists reading remotely are also impacted by network bandwidth and speed. Further, not all third-party viewers have the capability to display large file sizes, which may require installation of dedicated workstations at the imaging facility. As a result, facilities are resorting to deploying radiologists at remote facilities, which can dramatically increase labor costs and negate the benefits of teleradiology.

Downloading and pre-fetching patient studies onto a workstation might also introduce additional cybersecurity vulnerabilities, a major concern for facilities, as the healthcare industry experienced more breaches due to cybersecurity than any other industry.[1]

[1] Health Care Industry Cybersecurity Task Force. Report on Improving Cybersecurity in the Health Care Industry, June 2017. Available at: https://www.phe.gov/Preparedness/planning/CyberTF/Documents/report2017.pdf

Reduce Clicks and Increase Bandwidth Usage

The Exa Platform can help overcome these limitations with a cost-effective solution that requires no expensive IT upgrades. What's more, the SSR technology on the Exa Platform helps facilities embrace remote reading/teleradiology for a more cost-effective and productive workflow.

When compared to non-Server-Side Rendering technology, using the Exa Platform reduces up to 65% of network traffi c related to radiology imaging by reducing the volume of data required to transmit to each workstation. In environments where multiple users pre-fetch the same exams from a shared worklist, the bandwidth savings is signifi cantly greater.

BANDWIDTH UTILIZED

Legend:
- Exa®
- Non Server-Side Rendering

Chart: BANDWIDTH UTILIZED (MByte) comparing Exa® (blue) and Non Server-Side Rendering (orange) across:
- CT ABD (425 MB)
- CT HEAD (458 MB)
- MRI BRAIN (564 MB)
- MRI LUMBAR (428 MB)
- MG BILAT TOMO (1.42 GB)
- PET (1.1 GB)
- MG BILAT TOMO (1.62 GB)
- PT CTA (923 GB)
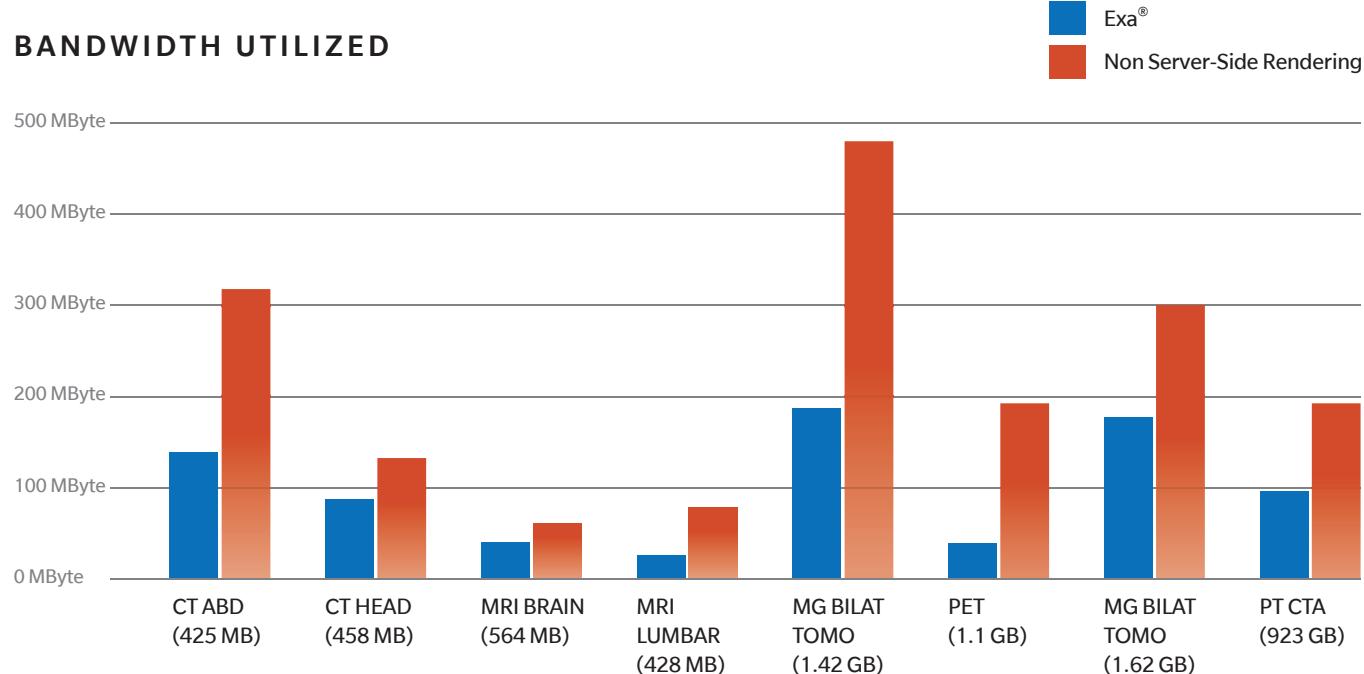
According to Randy Robinson, owner, Radiology Imaging Solutions, a Grand Rapids, Michigan-based teleradiology provider and one of the state's largest radiology imaging suppliers, the Exa Platform has helped reduce reading times from an average of 4-5 minutes down to 1 minute.** In addition to increased productivity and reduced report TATs, Robinson says the Exa Platform is also enhancing the quality of the reports and reducing radiologists' fatigue and stress. Not only are the radiologists more satisfied with their job, they have also indicated they could further increase volume.

"Once we replaced our old PACS with the Exa Platform, our radiologists said they could increase their workload and not be overworked," said Robinson. "That's how much faster, simpler and convenient this solution is over other systems they have used. What might take two to three clicks to read a study on another system, with the Exa Platform it is one click , and the study opens with their hanging protocols."

Conclusion

At Konica Minolta Healthcare, we understand the challenges that provider organizations face when trying to manage the strain put on IT networks. With the help of SSR, institutions can rest assured that files can be accessed quickly, productivity will increase, and costs will be effectively managed with ease. The Exa Platform is a breakthrough, developed with our customers in mind, and is a product that could only be brought to you by Konica Minolta

*   Figures derived from testing with legacy Konica Minolta technology.

** Reading time is based on General Radiography Studies, with a similar reduction in reading time for Ultrasound, Mammography and other modalities.

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