

# Enterprise Access Viewer

## Connecting technologies, physicians, and patients

### ABSTRACT

To improve value and minimize patient exposure to ionizing radiation, healthcare providers' use of medical imaging must be prudent and appropriate. The cornerstone of value-based imaging is technology that provides broad access to patient reports and images, enhancing communications among physicians and with the patient while protecting patient data. This is the role of the enterprise viewer.

Embedded seamlessly in an EHR accessible from the office or remotely at the bedside via a web-enabled device, an enterprise viewer must balance ease of access and data protection. Pure HTML 5 technology—also referred to as zero-footprint—enables launching from virtually any device with a web browser. Requests are communicated to a server that retrieves the data, processes it, and transmits the image without downloading data to the device.

In addition, an enterprise viewer is often accessible by thousands of users at once. It must be simple to deploy and maintain, with little training required, and must easily adapt to work with healthcare IT systems that are already installed.

### THE INFORMATION GAP

The most crucial aspect of every radiology diagnostic report is the image. Yet referring physicians and other clinicians typically see only words—the written reports and conclusions dictated by radiologists. Some radiology information systems, such as the Carestream RIS, allow images to be embedded in reports. Even then, however, referring physicians see only selected views.

To address this challenge, clinicians may receive digital images stored on portable media such as CDs. Providing digital images this way represents an improvement over film, but, like film, CDs must be physically delivered, risking damage or loss. In addition, there's no guarantee that referring physicians will be able to see the digital images due to the variety of viewer applications, file formats, hardware configurations, security settings, and types of media in use today.

Noncompliance with the DICOM (Digital Imaging and Communications in Medicine) standard or corresponding IHE

(Integrating the Healthcare Enterprise) profile is also a concern. These problems may delay the delivery of appropriate clinical or surgical care and could potentially have a detrimental effect on patient outcomes.<sup>1</sup>

### Minimizing cost and radiation.

Providing easy access to patient images can cut down on the ordering of duplicate, unnecessary imaging exams. This helps contain rising healthcare costs and minimizes the exposure of patients to radiation.

These potential benefits were documented in a study of patients transferred from one hospital emergency department to another. When a system for uploading CD images was implemented at Brigham and Women's Hospital in Boston, the rate of redundant imaging exams for transferred emergency patients fell by 17 percent.<sup>2</sup> If these results are extrapolated to the 2.2 million patients transferred between emergency departments in the U.S. each year, importing images into PACS could result in 484,000 fewer CT scans.

Direct access to images using the web rather than CDs might broadly extend these benefits—not only across the U.S. but to all segments of medical practice.

### An electronic bridge.

Electronic access to reports and images increases efficiency and helps ensure that images are readable. This promises to benefit the patient, whose therapy or intervention might begin more quickly, or whose concerns might be alleviated sooner.

Radiology has long sought to develop networking solutions that support the easy and widespread transmission of images.<sup>3,4</sup> However, setting up networks with separate access to PACS has proven challenging.<sup>5</sup> The need for software and hardware dedicated to image transmission and processing bogs down the retrieval and display process. Moreover, the additional effort and time expended by the physician reduces efficiency and productivity.

This runs counter to efforts by policymakers worldwide to increase healthcare efficiency, as exemplified by the American Recovery and Reinvestment Act of 2009 (ARRA) and the Affordable Care Act of 2010. These statutes have greatly

## White Paper | Enterprise Viewer

increased the impetus to make medical images an integral part of the electronic health record.

Enacted as part of ARRA, the HITECH Act provides incentives and penalties to encourage “meaningful use” of certified EHR technology, including the ability to exchange “key clinical information” among healthcare providers. “Meaningful use” requirements and market pressures are both driving an exponential increase in the digital transmission of radiology and other diagnostic images—the cornerstone of modern diagnosis and decision making.

### INTEGRATING INFORMATION SYSTEMS

The ideal solution is to make patient data and images stored on the PACS or a clinical repository (vendor neutral archive) integral parts of the electronic health record. Successful integration depends on finding a way to either consolidate silos or federate multiple information systems.

One answer is a standards-based viewer or IHE-XDS consumer that can easily complement an existing PACS or repository.

Simplicity is key to the success of enterprise viewers as opposed to dedicated viewers that may require complex installation, ongoing maintenance, and extensive training. A zero-footprint browser-based viewer minimizes these requirements by relying on an enterprise-based server to manage and deliver images. An intuitive interface complements the simplicity of the zero-footprint design, allowing immediate use by anyone familiar with web browsers and the internet.

#### The missing link.

Simple to deploy, simple to learn, and simple to use, the zero-footprint viewer is designed to serve as an intermediary between the PACS, the clinical repository, and the EHR, affording referring physicians convenient access to all of their patients’ clinical images.

To fulfill this potential, the viewer must have a sophisticated design to enhance physician access to all diagnostic images. The viewer must provide side-by-side comparison of DICOM images as well as other clinical data such as JPEG photos, videos, ECGs, and scanned PDF clinical documents.

The viewer should be easy to embed in an EHR to provide access to reports and images alongside the patient’s other medical information—without requiring the user to open a new application and leave the medical record.

Use of the viewer must not be restricted to a single IT system or facility. It should offer extensive compatibility to provide secure access to images across and beyond the enterprise for physicians and patients alike.

#### A universal solution.

Improved communications may be especially beneficial in emergency medicine. A study conducted at the University College Dublin School of Medicine and Medical Science in Dublin, Ireland, found that handheld devices may be particularly helpful for emergency teleconsultation purposes, supporting detection of basic orthopedic injuries and intracranial hemorrhage.<sup>6</sup>

A universal viewer may prove valuable in other medical settings as well—notably in rural medical settings, where primary care physicians often need to consult with specialists such as neurologists. At facilities with electronic health records, a zero-footprint viewer embedded in the EHR system could provide ready access to images in the context of other patient data. And it could do so easily, without the training, expense, or time that would otherwise accompany the installation of interfaces between PACS and other information systems. This could potentially help drive the adoption of EHR systems.

### THE CARESTREAM SOLUTION

Carestream’s Vue Motion viewer exemplifies an effective zero-footprint enterprise viewer. It provides on-demand access to patient images, yet is simple to deploy and maintain, works with IT equipment already installed, and requires no specialized training.

Widely compatible with mobile and personal computing platforms, Vue Motion provides widespread adaptability and an intuitive interface proven to eliminate the need for specialized training. Vue Motion is inherently easy to understand, unlike dedicated and complex viewers requiring hours or days of training. While the training burden of a dedicated viewer may be expected in the radiology department when learning to use new visualization tools, it is very likely a deal-breaker for other departments and physician offices.

Vue Motion launches easily and quickly without requiring extensive computing power or requiring the user to log in to another system. It leverages the server to do the vast majority of the rendering, thereby significantly reducing the volume of data to be transmitted. And, because rendering is done on the server side, there are no data storage requirements on the

## White Paper | Enterprise Viewer

zero-footprint side. This enables easy deployment of Vue Motion, as it requires no processing or archival software. The zero footprint also makes upgrading a snap, as software enhancements are done on the server.

In this way, Vue Motion affords easy access to patient images, reports, and other supporting data throughout and beyond the healthcare enterprise, enabling real-time collaboration among clinical users. It can be embedded seamlessly in an EHR system. Or, it can operate remotely, integrating with other healthcare IT systems to boost workflow.

Vue Motion is a true universal communications and productivity tool. Delivering reports, images, and other patient data to the referring physician, it focuses attention on pathologies, allowing the physician to visualize patient problems. And, it enhances communications, allowing the physician to more readily convey particular medical concerns to the patient.

### A look under the hood.

Using HTML 5 technology, the zero-footprint viewer launches from a variety of operating systems and devices, using only a web browser. Requests are sent to a server, which retrieves the data, then processes and transmits the image. Consequently, Vue Motion requires minimum bandwidth—despite its high performance and rapid access to images.

### Collaborative workflow.

An intuitive user interface is employed to view enterprise patient data in DICOM, non-DICOM, and other supporting file types. Vue Motion further enhances collaboration by supporting the transmission of electronic sticky notes, critical results findings, and email messages with embedded links to relevant patient studies.

### System-agnostic.

Vue Motion bridges information technologies—just as it connects radiologists with referring physicians, and physicians with patients. It is system-agnostic, connecting not only to other vendors' PACS, but to DICOM archives and XDS repositories. As an IHE-XDS consumer, it can be easily integrated with diverse departmental systems so that clinicians and referring physicians gain fast and easy access to patient data and images.

Vue Motion can be embedded in an EHR and EHR portals to access images contained in the PACS or clinical repository, thereby image-enabling the enterprise. The viewer can be

launched without calling up a separate application or logging in to another system. Alternatively, it can be launched in its own window without requiring a separate login, using a URL from within the system. By promoting the exchange of key clinical information among physicians to enhance understanding of medical conditions, Vue Motion potentially satisfies a key “meaningful use” criterion as mandated by the HITECH provisions of the ARRA.

### To PACS and beyond.

As a module of the Clinical Collaboration Platform, Vue Motion can be supplemented with Vue Connect to synchronize multiple PACS at different facilities. In addition, Vue Motion can be complemented by Vue Archive, the vendor neutral archive module of the platform, to consolidate multiple storage devices and allow a single point of access from local, regional, or national repositories.

While optimized to retrieve and display DICOM data, Vue Motion can also display non-DICOM data including JPG, AVI, native ECG, DOC, and PDF files. And this unified solution has FDA clearance for clinical reading across all data types: DICOM, photos, videos, scanned PDFs, native ECGs and physician documents (CCD) stored on PACS or VNA.

Encryption using the SSL (Secure Sockets Layer) protocol ensures data security. HIPAA compliance is supported through permissions tools that restrict access to referring physicians, so only they can see data pertaining to their patients. In addition, a built-in auditing tool tracks logins, data accessed, and how data were used—documenting files viewed, who viewed them, and what was done with the data. Audit files can be exported into various formats, including Microsoft Excel, for offline analysis.

### What's next.

As part of Carestream's Clinical Collaboration Platform, Vue Motion brings patient-centric diagnostic imaging to stakeholders across the healthcare enterprise. The platform's unified core and extensible modules enable workflow management and image access virtually anytime and anywhere. Managed locally or hosted by Carestream on our secure cloud service, the Clinical Collaboration Platform easily integrates the systems you use today while providing all the scalability and innovative tools you'll need tomorrow.

The future of healthcare is seamless collaboration. Make it happen today with the Clinical Collaboration Platform. Learn more at [www.carestream.com/clinical-collaboration](http://www.carestream.com/clinical-collaboration).

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### CITATIONS

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