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# Zero-footprint Viewer + Server-side Rendering: Building a True Web PACS

*By Cheryl Proval*

When the development team at Viztek convened to reimagine its current PACS release, the first thing that went onto the white board was "zero footprint viewer—no exceptions." To make that happen, Viztek approached the company that holds the exclusive patent on the idea of presenting a DICOM image in a Web page to obtain a license from Heart Imaging Technology.

Accessibility, however, was not the endgame: Viztek also sought a complete diagnostic experience with full viewing functionality—so server-side rendering was added to the mix. In a Q & A with Steve Deaton, vice president, Viztek, Raleigh, N.C., ImagingBiz took a look under the hood of the company's new Exa-PACS release.

**ImagingBiz: What is a zero footprint (ZFP) viewer and why was it so important to Viztek?**

**Deaton:** A true zero footprint viewer is a cloud-based viewer that does not require any additional installs at the local workstation to support full diagnostic toolsets.

A zero-footprint viewer exists 100% within a Web browser with no add-ons, widgits, Active-X controls or anything to give the computer any other problem (or reason) to butt heads with any other program. It's just a viewer—though powerful and diagnostic—that exists solely within a Web page: If you log into a Web site with credentials, you see your list of studies.

True ZFP is substantially different from other PACS viewers, which require that additional program(s)be installed, triggering the need for administrative privileges That means someone from IT has to come up and log you in to be able to install or update it.

Steve Deaton, Vice President, Viztek, Raleigh, N.C.

Since ZFP operates in a Web browser, it will work on Apple computers, Microsoft operating system, even Linux, whatever workstation a facility wants to roll out, it will work natively with that.

The market is craving the 2.0 version of accessibility. Radiologists want all of their tools and all of their functions, whatever computer they sit down at, whether it is a one-month-old high-end computer or a five-year-old laptop. ZFP is ideal for both the radiologist and the IT team.

**ImagingBiz: Is Exa-PACS primarily a software solution or is hardware involved as well?**

**Deaton:** It has server-side rendering. The typical PACS viewer has to download the whole DICOM dataset and likely uses pre-fetching or auto-routing to get studies to each workstation intelligently.

Since everything exists within a Web page with this new product, the combination of zero footprint and server-side rendering means that there is no more need to pre-fetch or auto-route studies. A radiologist sitting at a hotel or a hospital and logged into another site with a mediocre Internet connection can open a 6,000-slice CT study in 3 seconds with no prefetching or auto routing, They will be able to see full diagnostic quality and use all of the advanced tools—MPR, MIP, synchronized scrolling. This is not a lite product just opening up accessibility.

**ImagingBiz: If this patent has been around for a decade, why aren't zero footprint viewers more prevalent?**

**Deaton:** Heart IT had the patent for many years, but code languages that are robust enough for diagnostic zero footprint have not existed until pretty recently. Over the last few years, some code languages like HTML 5 have helped to get zero-footprint moving, but not diagnostic quality– that's the real difference.

The market just now is on the cutting edge of heating up, and technology can support these ideas if you have a sharp programming staff. New coding languages have recently been invented, and when leveraged, you can now write very complex programs into a Web page natively—like a whole DICOM viewer with MIP and MPR and all of that. Every year our programmers attend conferences such as those hosted by Google and Facebook. While we are not going to get into creating a search engine or a social media Web site like Facebook, we are going to become aware of other coding trends that can benefit a high-transactional, busy, busy market.

**ImagingBiz: What functionality does this ZFP technology have that others don't?**
**Deaton:** The full diagnostic capability is big; multi-monitor support is very big, the fact that we have a solution to integrate voice dictation and voice recognition while still remaining ZFP is huge. Nothing needs to be installed on the computer for a radiologist to sit down and read a 5,000-slice CT with MIP and MPR, and dictate the study. On a stranger's computer, securely, over a mediocre Internet connection, it works. Full functionality was our goal.

**ImagingBiz: What doors do you see this opening versus traditional software viewer applications?**
**Deaton:** A lot of physicians are forced to punt because it is too difficult to carry their large datasets around with them. You've seen an evolution where PACS went from a thick workstation to offering a lite viewer which maybe an orthopedic could access from the operating room so they could have reference to images from the clinic without bringing them all in on film.

I say punt because they had limited functionality or limited access. There is always a give and take to juggle security, convenience and diagnostic quality. I think the difference between this and any prior product in the market is you get all three: you get diagnostic quality, you get the convenience of access, and you get the blessing of IT, because IT doesn't have to do anything to enable this application or support it.

**ImagingBiz: What are the hurdles in integrating with third party VR systems and EHRs?**
**Deaton:** When you want to integrate with someone else's solution, it will tie directly into their solution, but you give up a little bit of the zero-footprint. We have to install a widget to tie into it, but we do our own interfaces in-house. Our product stays zero footprint, but when you integrate it with a third-party solution, their product is probably not zero-footprint.

**ImagingBiz: What benefits does ZFP technology provide in the area of workflow flexibility?**
**Deaton:** Since there is no auto-routing or pre-fetching required, we now have a dynamic workflow engine, which allows you to create any status and tie it to any other status or statuses in any order. It has nothing to do with transferring large datasets around.

With our prior PACS, you had to worry about statuses: If I changed from one status to another, I had to route studies from Dr A to Dr B instead, and then I had to worry about whether Dr B'S internet is slow or the studies were big. Now that we don't have to worry about pushing studies around, we can build the most complex rules possible.

**ImagingBiz: What are the patient care benefits this technology can enable?**
**Deaton:** When Web-based PACS came out, we had to start worrying about how to manage, control and support access for physicians who own their own clinics and needed access to images: What is this doctor's Internet connection, how old are his or her computer in the urology clinic, are they Mac or PC, and then, when something doesn't work, does their IT team fix it or does mine? We saw that complication spiral out of control over the last five years.

Now the market is pushing for patients to have access. This new platform will not only eliminate all of the problems for the surrounding physician offices, but it will prevent ten times the amount of problems once you introduce access at the patient level.

If you have one community hospital, you have 100 physicians around it and 10,000 patients around them Since this is zero footprint, as long as they are using the password—just like they are with AOL or Gmail—they are good to go. This is the first big enabler for patients to have access.

**What about protecting patient data? How does IS feel about this technology?**
**Deaton:** When you look at any Web-based PACS out there today, they all have a viewer component that has to be installed on a local computer. Whenever you use a traditional viewer, you are downloading DICOM data to that computer. What are the odds that it could get copied, hacked, seen?

With a ZFP viewer, you are never downloading any DICOM data. It's purely server-side rendered. The second you log off or close the Web browser, not only are there no files in the cache, there never were any files in the cache. This product removes that risk. It's encrypted at rest where it lives on the server, and it is encrypted within that user's login session.

If you log into your bank Web site and enter a user name or password, a little lock appears in the corner of your browser, meaning that there is an encryption tunnel between you and the bank and everything you are doing in there is encrypted, so no one else can see it. Even if they hacked into your home network, they wouldn't be able to see it flying across the Internet. We use the same thing.

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