Article

Cloud: This is Enterprise Imaging

By Mary C. Tierney. Featured in Health Imaging, May 2022

Medical images have long lived on legacy spinning disk. But healthcare systems are now leaving behind those on-prem, awkward boxes that require too much real estate, IT support and expense. Cloud is the choice to support enterprise imaging. If it feels like healthcare cloud is everywhere, you're right. And here's what you need to know to do cloud right.

Enterprise imaging powered by a single IT system has changed the business model of medical imaging. To support EI, healthcare systems are now opting for secure, always-on cloud storage paired with fully managed services, at a predictable cost.

Cloud is increasing performance significantly in managing and accessing images as well as data across radiology, cardiology, pathology, orthopedics, ophthalmology and others. It supports the increasing use of commercial and locally developed AI, and inhouse research projects. A fast and secure offsite backbone to manage terabytes and petabytes of data, that's where cloud becomes essential.

Cloud users often bring up words such as application performance, scalable, reliable, immediate access and secure when discussing the clear benefits. Tight integration, agility, usability, better redundancy and distributing data for greater security are mentioned too.

With fully managed cloud services, vendors handle hardware, software, upgrades, scalability and security. That allows the IT staff to focus on value-add tasks such as improving clinical workflows. This simplifies how physicians and IT personnel consume and interact with data. That includes taking full responsibility for storage, servers and a guaranteed cost for cloud infrastructure. To the IT staff, it means they can focus on clinical and operational projects that enhance productivity, care and outcomes systemwide.

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Marty Tedlock, Enterprise Technology Architect, John Muir Health

But why cloud? Why now? Skyrocketing image volume and the complexity of managing medical images top the list of reasons, with many more challenges extending from there.

"On-prem is not the way to manage the extremely large image sets from digital pathology, breast tomosynthesis and the imaging case sizes," says Kjetil Nilsen, global commercial director cloud at Sectra. "Healthcare systems also have the need for increased collaboration and data sharing across disciplines, departments and with patients. Cloud brings that. We also see greater use of outpatient imaging and teleradiology too. Both are well suited for a cloud set up. The COVID pandemic also really increased the demand for home reporting and virtual access to data. All of these challenges are pushing people to cloud."

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Judy Bartlett, Associate VP for Application Delivery, John Muir Health

Surging image volume was the reason the team at John Muir Health in Walnut Creek, Calif., decided to move to the cloud in 2017. The three-hospital, 1,000-physician healthcare system near San Francisco also needed a reboot to improve cybersecurity, clinician productivity and disaster preparedness based on local threats of earthquakes, fires and power blackouts. [5 years into the cloud, John Muir Health is just getting started | Sectra Medical]

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Knowledge and passion

"We could not get our heads around the exploding growth," recalls Enterprise Technology Architect Marty Tedlock. "We would have half-day exercises with white boards trying to figure out, 'OK, how much disk space do we have to purchase to stay ahead of imaging *just over the next couple of months?*'"

The data deluge had been building at John Muir Health for some time, he says, but the arrival of 3D breast tomosynthesis made the search for a better solution urgent. Case in point: One 3D mammogram acquired via digital breast tomosynthesis adds about 500MB of image data to a hospital's storage system. On the high end, a single study can require 3GB of server space. And as Tedlock recalls, "At that point, oh my gosh, I was having heart attacks trying to figure out where I was going to put all this image data."

His colleague Judy Bartlett, associate VP for application delivery, remembers the tomo-driven growth spurt coinciding with John Muir Health's ambitious overall growth plans. The health system was adding or expanding one practice, clinic or facility after the next. And they needed to manage all the images on one system.

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The concern reached the top of the IT division when a storage area network failed. Tedlock recalls the CIO setting a new direction on the fly.

The new direction was cloud, with the organization partnering on cloud and cloud services with Sectra, John Muir's PACS provider since 2001. "Our information security team had already blessed the Microsoft Azure solution," Tedlock says. "I wouldn't say it's a one-stop shop, but the existing Sectra-Microsoft partnership made things very simple. It carried a lot of weight into the decision of going forward with the cloud solution from Sectra."

Topping the tipping points

Cybersecurity and data security are big motivators too as ransomware attacks plague hospitals every day—with ever higher financial stakes. In 2021, the cost of a single healthcare breach data rose to $9.23 million—a $2.2 million increase over the previous year. It was the 11th year in a row with an increase. ("The 2021 Cost of a Data Breach," IBM Security and the Ponemon Institute, July 2021.)

"Healthcare providers managing their own data centers are really struggling to keep up-to-date on security systems and the required patching across multiple servers in order to protect themselves from cyberattacks," Nilsen says. "That's something we can do much faster and better than they can do on premise—for hundreds or even thousands of applications."

On the same topic, health systems struggling with recruitment of IT staff with the right knowledge and skills in security is also a factor that has fueled the adoption of cloud.

Cost in terms of total cost of ownership and return on investment are still other reasons healthcare organizations are considering cloud. In fact, Nilsen calls the business case around cloud the most compelling driver for adoption.

"Up until now it's been difficult to compare the investment of an on-prem solution with cloud," he says. "Now the pricing model is more straightforward. Providers are beginning to understand and feel confident in the pricing model and how to estimate cost-savings. And the barrier we saw when IT departments felt too much pride to bring in a vendor to manage infrastructure and hardware is gone. There are plenty of clinical projects and strategic initiatives for IT to focus on to create value for the hospital."

But where to begin?

The cloud conversation should start early in the process of buying new imaging equipment or bringing on additional facilities. And teams need to compare offerings.

"By nature, a cloud solution comes with new value-added benefits and the supplier takes a bigger responsibility," Nilsen says. "Just comparing costs is not enough. The key is to understand the total value created. You always have the possibility of a hybrid solution where the long-term image archive is stored securely in the cloud, and readily accessible from your on-premises solution. It's a good first step in a cloud transition as healthcare systems see immediate cost savings and increased scalability of storage. They still have control on prem, they're only archiving images to the cloud."

Nilsen and his colleague Håkan Ritzen, senior solution architect at Sectra, both agree that conversations about cloud very much depend on the maturity of the clinical and IT leaders' views. "It comes down to their trust for the cloud and how fast they want to move to it," Ritzen says. "Some have a gut feeling that cloud is not trustworthy enough. But even that is fading. We ask them: 'Are you sure you have secured your data?' Often, they are not sure. Needing to invest in a new hardware solution for their long-term archive—whether it's full or faulty—is the perfect fit for cloud. And it's secure."

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And as Ritzen adds, "we're all using cloud servers every day and in our personal lives. So what's unique to healthcare? Nothing really. From a business perspective, we should be benefitting from cloud for performance, security and scalability with the immense data growth we have in healthcare."

Technology + services

Confidence in cloud rests on solid technology. The solution John Muir Health chose five years ago combines Sectra's cloud-based enterprise imaging software and Microsoft Azure, the cloud used by some 95 percent of Fortune 500 corporations. Security is backed by more than 3,500 Microsoft security experts and a $1 billion+ annual investment in cybersecurity. Sectra also brings 30 years of cybersecurity expertise and focus on critical infrastructure. [Enterprise imaging is going to the cloud—but should you go private, public or a hybrid? | Sectra Medical]

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"Security is a cornerstone in the service we provide, and Azure is probably the most secure public cloud out there," Nilsen says. "With Sectra's expertise and background in security, and a multi-layered security strategy, we take a holistic and in-depth approach to cloud security. And we can take advantage of state-of-the-art security provided by Microsoft across physical datacenters, infrastructure and operations in Azure."

Sectra's cloud offering is a subscription-based software as a service (SaaS) instead of a traditional licensing model. Hospitals have access to the functionality of the system even though applications and data are hosted off-site in a cloud infrastructure. The applications are accessible from various client devices through a web-based interface, via a high speed and low latency connection.

The vendor handles all server software and hardware, upgrades and maintenance. They also manage the cloud network, operating systems, databases and storage. Proactive monitoring 24/7, and secure design are also a part, as is a 99.99% guaranteed uptime.

That goes for multiple data centers too. “Availability and resilience are built into the service,” Ritzen says. “Right out of the box, data is synchronously replicated to several data centers within the solution. Cloud services also allow the possibility to have a georedundant solution to another area of the cloud, located in a different area or country.”

Sectra’s cloud offering enables a unified consolidation strategy for the whole stack for imaging needs. And that’s just what physicians and clinicians want and appreciate.

“The single biggest thing from a radiologist’s point of view is that the system is now much faster,” says Jim Carmichael, MD, a pediatric radiology and clinical lead for PACS at Guys’ and St. Thomas’ NHS Foundation Trust in the United Kingdom. The organization deployed cloud in 2017. [The first NHS PACS in the cloud – faster, safer reporting at Guy’s and St Thomas’ | Sectra Medical]

“It delivers images quickly,” he says. “The configurability of the system allows us to send imaging to the specific group of sub-specialists who report it. That is a complicated thing to do, but the system is sufficiently configurable that we can do that.”

Driving efficiency, driving performance

Cloud enables care delivery anywhere, anytime, to any patient, at a controlled cost. It’s the path forward in 2022.

Cloud and the services wrapped around it change the way imaging departments work by harnessing control of their vast image volumes and improving access.

The game changer is the way Fredrik Gustavsson, Sectra’s CTO, describes it, in terms of reducing complexity in hardware and software across enterprise imaging. “Hardware refreshes are done, software is managed as a service, so it’s always up to date,” he says. “Healthcare organizations can scale as they need, now and for future growth. We take on the heavy IT lift so internal folks focus on more key parts of medical care.”

When you ask users who’ve paired cloud technology and services, they talk about the ease of transitioning quickly, “fewer headaches” and greater performance. And few forget to mention the peace of mind that comes from no longer needing to anticipate hardware refreshes and automatic upgrades and updates. Enterprise imaging is always state of the art. The cloud is always growing and scaling so it can accommodate the surge in artificial and augmented intelligence projects; both commercial installs and internal research projects.

“There’s no need to wait for provisioning of hardware to add AI or other ‘ologies,” Gustavsson notes. “We can do very rapid provisioning to bring on new servers and new resources. That alleviates all the friction for end-users wanting to get projects rolling. They can, very quickly.”

“Scalability is nearly unlimited,” Nilsen adds. “Controlling the whole delivery of data, we can change and respond to changing needs quickly. Just like physicians need to respond quickly to patient and other providers’ needs. That’s the true reason organizations are looking to the cloud to solve so many challenges.”

And the benefits they see are real, vast and far reaching. Many healthcare systems are currently adopting enterprise imaging as a cloud service. More still have learned that it’s not just a matter of changing on-prem installations to an external hosting party. The sum becomes greater than its parts with the right combination of cloud, software and a fully managed service—bringing the true benefits of the cloud that the industry has promised healthcare for many, many years.

Sectra AB • info.medical@sectra.com • medical.sectra.com

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