

How Clinicians Can Improve Quality of Care with **All-Flash Storage** for Enterprise Imaging

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Health systems have an enormous opportunity to improve patient care by upgrading the storage infrastructure supporting their enterprise imaging systems, specifically picture archiving communication systems (PACS) and vendor neutral archive (VNA) solutions.

Using a modern storage platform to support these critical systems will particularly benefit radiologists and other clinicians—as well as their patients—by giving them faster access to better and more accurate information at all stages of treatment, including at the point of care.

Benefits to key stakeholders are:

- **Radiologists** can make more informed decisions by accessing prior test results and images quickly and without compromise or complications. This holds true even for highly complex images that require huge data sets, such as tomography, or those that use analytics technologies, such as radiomics.
- **Other clinicians** can improve patient care by leveraging a network-based collaborative care environment that is highly reliable and delivers faster access to images, faster analytics and cloud-enabled agility and resiliency, among other benefits.
- **The health system** can leverage clinical improvements to meet quality of care mandates and increase patient satisfaction. Upgrading PACS and VNA systems will also help drive new opportunities through mergers and acquisitions, new specialty services and new lines of business.

This paper examines the critical roles PACS and VNA systems are playing in allowing radiologists, other clinicians and health systems to improve quality of care. We also discuss why upgrading and modernizing the underlying storage is key to maximizing the value of these systems. Finally, we look at why all-flash storage is becoming the go-to technology for these systems and what to look for in an all-flash storage platform.

The evolution of enterprise imaging

It is truly a time of great change—and opportunity—for clinicians who want to leverage advanced imaging technology to improve patient outcomes. PACS enables clinicians to quickly access a central archive for all types of image sets from a wide range of departments, such as radiology, cardiology and pathology.

VNA systems help clinicians and healthcare systems mitigate the potential negative impact of information and departmental silos. Using vendor neutrality, VNA systems enable seamless and simple processes for information-sharing workloads and management of images and other clinical information.



Among the benefits of these solutions:

- **Better care:** Health systems can now store all types of images and make them immediately available to clinicians at the point of care, including X-rays, CT and MRI scans, visible light photographs, photographs, ultrasounds, videos and whole slide images captured in the pathology department.
- **Simpler collaboration:** Individual departments and clinicians can improve collaboration across the health system by eliminating silos. In addition, they can use

analytics and machine learning technologies across the system to access better, more recent images, improving customer care.

- **New revenue streams:** By extending imaging to the edges of their networks, health systems can be more efficient and agile in supporting new service lines and revenue opportunities.

However, to achieve these clinical and systemwide benefits, the infrastructure that supports PACS and VNA systems must be up to the task. The infrastructure must be able to accelerate the availability of images, support real-time analytics, and enable universal access to all images on demand, with advanced rendering capabilities.

Complicating this pressure for greater performance, however, is the additional reality that data storage requirements for PACS and VNAs are growing at a dramatic pace: More than 40% of healthcare executives say their data volume is growing at a rate of more than 50% a year.¹

In addition, clinicians are not only relying on digital imaging more than ever, but also leveraging new technologies that require ever larger data sets. It is common for hospital radiology departments to generate more than 10 terabytes of medical image data per year, according to research from TechTarget.² They want to share these images among colleagues and patients across the network, and use them with technologies such as radiomics and other advanced analytics.

Why modernizing storage is essential

The need to address both performance and capacity challenges places a huge burden on the storage platform. To meet the needs of today's PACS and VNA solutions the storage platform must be able to:

- **Deliver better response times**
- **Simplify collaboration**
- **Eliminate silos**
- **Support advanced technologies such as 3D rendering**

1 "Top 5 eHealth Trends," Accenture, 2015

2 "How can medical imaging archiving systems get the most from storage tech?," SearchHealthIT.com, Sept. 8, 2016

- Ensure high performance for analytics and support all image types, including those with extremely large datasets
- Provide faster, ubiquitous availability—even as bandwidth requirements grow significantly
- Simplify imaging to facilitate growth in service lines, new business opportunities, and merger and acquisition activities

Legacy arrays that rely on spinning disks cannot meet these requirements, particularly when it comes to speed. Some organizations have tried using hybrid arrays with flash storage as either cache or a storage tier, but these have turned out to be stopgap solutions at best.

Hybrid arrays don't provide the performance consistency required of modern PACS and VNA systems, and they are becoming increasingly obsolete—providing no path to the future and potentially impeding the opportunity to improve care in the immediate term. They also absorb resources and add to costs because of their large footprint and power, cooling and maintenance requirements.

Why all-flash storage?

Healthcare IT professionals, clinicians and healthcare administrators are finding that the only way to fully meet the performance and capacity demands of modern PACS and VNA solutions is to utilize all-flash as the storage platform. All-flash storage solutions provide orders of magnitude greater performance than spinning disks, while also delivering much faster and more consistent performance than hybrid arrays.

With all-flash storage, radiologists and other clinicians can leverage their PACS and VNA systems to access images faster than ever before at the point of care. They can also utilize real-time image analysis to make better and more informed decisions and achieve universal access to all images on demand, supporting a collaborative, integrated care model.

When coupled with the ability to truly leverage analytics across an integrated care platform, the performance gains enabled by all-flash storage provide clinicians with the



opportunity to deliver a level of care they have never been able to achieve before.

But all-flash storage is not just about performance anymore: With the right all-flash storage platform, the entire health system benefits from lower costs, simplified operations, easier and more infrequent migrations, and a future-proof upgrade model that can support PACS and VNA solutions even as they continue to expand and place more pressure on the underlying storage.

What to look for in an all-flash storage platform

It is important for clinicians to understand that there are different architectural models for all-flash storage solutions. In evaluating solutions for PACS and VNA systems, certain characteristics are essential. These include:

- **Performance consistency:** Most all-flash arrays will deliver high performance, but performance consistency is also critical, particularly when dealing with medical images that can affect lives.
- **Reduced complexity:** The architecture of the all-flash solution should be designed to reduce complexity at every stage of the lifecycle, from initial deployment, to ongoing maintenance to scaling and upgrading. For clinicians, complexity can lead to downtime and delays, which introduces unnecessary risks.

- **Lower costs:** Costs are always a concern in healthcare. One of the myths about all-flash storage is that it is more expensive than spinning disks. This is no longer the case, given price reductions in flash storage and design improvements in arrays, including features such as in-line deduplication and compression.

When it comes to delivering the key criteria for modern enterprise imaging systems, Pure Storage offers a unique value proposition versus all other all-flash storage providers. A Pure Storage FlashArray delivers consistent sub-millisecond latency at hundreds of thousands of IOPS, regardless of size, even in mixed workload environments.

In addition, Pure Storage arrays are virtually plug-and-play solutions, accelerating time to value because they are simple to install and manage. They also maximize storage capacity through industry-leading compression and deduplication techniques.

Pure Storage is the first all-flash array vendor to offer a deployment model that eliminates the need for costly and expensive forklift upgrades every few years. Called Evergreen Storage, this model enables health systems to stay current with technology advances while continuing to maximize their existing investments. Less frequent, non-disruptive upgrades lower the cost and risk of migrations.

In addition, Pure Storage continues to innovate for the healthcare market, including a new category of array called FlashBlade. FlashBlade delivers high performance, simplified manageability, high density and cost efficiencies for file- and object-based storage environments. This gives clinicians and IT departments yet another option as they look to modernize their PACS and VNA systems.

Conclusion

Advances in enterprise imaging technology are providing an opportunity for health systems and their clinicians to dramatically improve patient care and outcomes. PACS and VNA systems have the potential to deliver valuable, highly accurate images to the point of care in real time, while also leveraging analytics to provide more meaningful information than clinicians have ever been able to access.

To maximize the value of these systems for clinical care, it is critical that the underlying technology can meet performance, speed, reliability and capacity requirements, which are becoming much more challenging as imaging technology becomes more sophisticated and widely used by clinicians across health systems.

As discussed in this paper, all-flash storage has emerged a critical technology in enabling clinicians to use PACS and VNA systems to improve quality of care. With the right all-flash platform, clinicians can make better decisions and improve patient outcomes, while health systems can improve operations, lower costs, strengthen their relationships with patients, and create new services and revenue streams.

To learn more about how your organization can improve quality of care and patient outcomes through the use of all-flash storage for your PACS and VNA enterprise imaging solutions, please visit Pure Storage at purestorage.com/healthcare.
