The Challenge
With the Health Information Technology for Economic and Clinical Health (HITECH) Act, healthcare organizations are required to electronically capture physician orders for at least 30% of radiology procedures. Organizations also must make diagnostic test results, including radiology reports, available to patients within 24 hours. These necessities dramatically increase storage requirements to meet capacity demands to securely receive electronic orders for diagnostic tests, quickly provide test results, and meet retention guidelines for all imaging files generated for each order. As a result, many healthcare organizations now have numerous fragmented archives within the data center and across remote medical facilities. In addition, the unique electronic health records (EHR) interface for each picture archiving communication system (PACS) adds complexity and cost to the IT infrastructure.

Implementing a vendor-neutral archive (VNA) helps healthcare organizations meet regulatory requirements. The VNA does so by merging all medical imaging data from multiple PACS archives to provide a consistent, open-systems approach to storing, retrieving, and archiving medical imaging data. This process significantly streamlines IT management complexity and assures data portability regardless of future software or hardware evolutions. As a result, radiology departments can choose the PACS system they want while making patient studies readily available to primary care physicians as well as the patients.

The NetApp Solution
NetApp and leading VNA providers, including Agfa Healthcare, BridgeHead, DeJarnette, GE Healthcare, INFINITT, Lexmark, Mach7 Technologies, Merge, and TeraMedica, have teamed up to address the medical enterprise image sharing and archiving needs and other related patient data needs for multiple departments in multiple hospitals. As part of this effort, the teams also help increase clinical efficiency and ultimately improve access to medical images. Working together, we help healthcare organizations share data-intensive medical images and reports with authorized medical specialists and facilities worldwide.

NetApp offers fast, simple, scalable, and reliable data storage: the ideal match for vendors’ PACS systems. Together, we offer a complete enterprise imaging infrastructure solution. You receive a superior image management system and a cost-effective, easy-to-maintain data storage component that lowers your total cost of ownership while enhancing profitability.

Make the Best Decisions for You and Your Patients, Every Time
Technology is reshaping how healthcare works. NetApp’s vision for the future of data management is to create a Data Fabric that spans your entire IT landscape. The Data Fabric enabled by NetApp takes the worry and complexity out of managing and maintaining control of clinical data across private and public cloud resources. Doing so
enables healthcare organizations to adhere to internal data security policies, maintain compliance with HIPAA and HITECH requirements, and promote greater innovation and IT responsiveness. With a Data Fabric enabled by NetApp, you can:

- Choose the correct mix of private and public cloud services that will result in providing patients with the most secure and cost-effective services.
- Have the data mobility you need for your data to flow seamlessly to wherever your clinicians need it most—across flash, disk, and private and public clouds.
- Achieve the speed to innovate faster using fewer resources to improve patient outcomes.

NetApp helps healthcare organizations embrace the cloud on their terms by integrating on-premises enterprise-class data management and control with the flexibility, speed, and economics of the public cloud. Advances in technology and cloud computing provide key capabilities to help the healthcare industry redesign storage systems to keep pace with tremendous data growth in clinical data. These advances also help you to do more within tight budgets. By enabling you to securely share, store, and retain data—including big data from multiology images, diagnostic reports, and other critical patient-care information systems—the Data Fabric provides the tools to transform patient care.

**Improve Operations with NetApp Storage**

Using VNA, NetApp helps healthcare organizations preserve and enhance access to legacy data while providing a solid, open framework for future growth and enhancements. With NetApp, you get even greater cost-effectiveness as data demands grow.

**High availability**

According to a recent IDC analyst report, NetApp achieves reliability of healthcare data as high as 99.999% in deployments using both NetApp® hardware and software. Doing so provides clinicians with reliable, rapid retrieval of patient information to improve patient care.

**NetApp RAID DP technology**

NetApp software–based solutions provide the performance of RAID 10 at the cost of RAID 5—with better resiliency—to enhance the availability of your patient-critical data. Patient data is “always on.”

**NetApp Snapshot copies**

NetApp Snapshot® copies periodically protect data with no performance impact and minimal consumption of storage space. Create Snapshot copies in less than one second while applications run.

**NetApp SnapLock software**

Analyze diagnostic images without risk of altering original records. Because SnapLock enables each image to be both unalterable and rapidly accessible, you are assured that initial record integrity is preserved.

**NetApp SnapMirror software**

SnapMirror® software copies patient images to a second NetApp system—essentially in real time—at a redundant data center. Mirror copies are available for near-instantaneous retrieval by hospital personnel, even during an outage of primary storage.

**NetApp FlexClone volumes**

NetApp FlexClone® volumes replicate data for testing and development of new applications or for formulating DR or HA procedures.

**NetApp SnapManager for Oracle, SQL Server, and VMware virtual infrastructure**

NetApp SnapManager® software automates protection more cost-effectively and reliably and protects your virtual data and data based on SQL Server.

**All Flash FAS**

NetApp All Flash FAS combines high performance with superior flexibility and best-in-class data management to speed up operations without compromising on efficiency, reliability, or the flexibility of your IT operations.

**NetApp Flash Cache and Flash Pool intelligent caching**

NetApp Flash Cache™ uses intelligent caching of recently read user data and NetApp metadata in the storage controller to help medical professionals quickly access patient data. This capability enables them to make critical decisions regarding diagnosis and treatment and to save lives. Get even greater performance with NetApp’s solid-state disk option, Flash Pool™ intelligent caching.

**Vendor-neutral storage with NetApp FlexArray storage virtualization software**

Make the storage you already own more efficient and flexible. With NetApp FlexArray® storage virtualization software, healthcare organizations can consistently manage storage arrays from multiple storage vendors—including EMC, HP, and Hitachi—and NetApp E-Series arrays with less effort.

**Consolidate Big Data for PACS and Medical Records**

PACS archiving consumes tremendous amounts of storage—up to terabytes or petabytes of storage. With the FlexPod® and NetApp solution, healthcare facilities have the ability to nondisruptively grow their data pools as needed to meet regulatory privacy and retention requirements. The unique FlexPod unified...
fabric and NetApp integration extend the ability to scale PACS, other imaging systems, and business applications throughout the enterprise. A consolidated enterprise content repository makes it possible to accommodate more images at less cost, while improving patient care and other healthcare services.

“As we began the efforts of consolidation across multiple campuses, it was important to us to build a solid, vendor-neutral image archiving foundation. Standardization and consolidation of technology across multiple campuses are strategic goals of the West Penn Allegheny Health System. To that end, we chose Acuo Technologies and NetApp because they provide the flexibility to build a foundation for image storage that will meet our needs today and well into the future.”

Carolyn C. Kelly, RN, BS
West Penn Allegheny Health System

**Enhance Patient Care Through More Reliable and Easier Data Access**

As workloads and healthcare professionals move between facilities within a healthcare network, their data is available to them through FlexPod and NetApp’s distributed or enterprise content repositories, no matter where they need access. This type of agility is difficult to achieve with traditional storage and application silos. Now healthcare professionals can access data even at a patient’s bedside.

**Store More Data at Less Cost with No Service Disruption**

With FlexPod and NetApp, healthcare IT professionals can make storage changes and test new applications nondisruptively. These professionals can do so while consolidating storage and reducing the overall cost of ownership and maintenance in one resilient and reliable virtual data repository. Nondisruptive operations and continuous data access enable rolling upgrades and maintenance. Critical patient services and healthcare operations are not affected.

**Preserve Existing Data Resources Yet Increase Datastore Agility**

FlexPod and NetApp, utilizing VNA, preserve your investment in existing storage while paving the way for more advanced next-generation storage technologies. With NetApp, you have the built-in agility to support both SAN and NAS aspects of a virtual storage environment on the same storage system with NetApp’s multiprotocol capabilities (FC, FCoE, iSCSI, NFS, or CIFS). You can scale storage to suit your immediate needs by easily provisioning new resources. You can use the same system for controlled or sensitive data that needs to be retained in tamperproof (WORM) storage to meet corporate or regulatory requirements. All of these benefits are not possible without an agile data infrastructure—the underlying architecture of the FlexPod solution.

**Increase Reliability and Security**

FlexPod with NetApp delivers an efficient data protection strategy for all data regardless of location, for both virtual and physical assets. This capability cuts management costs and complexity while providing a unified approach to data protection and availability. With FlexPod and NetApp, clinical and IT data can be stored in one virtualized data pool, making it possible to standardize and manage a single security and compliance strategy.

FlexPod with NetApp features built-in multitenancy capabilities to securely isolate sensitive data among applications. You can also assign multiple quality-of-service guarantees, making certain that the most critical and time-sensitive applications receive the highest priorities while relegating lower service levels to more routine network tasks.

Through its unified agile data infrastructure, NetApp includes embedded data security and data protection software. Using NetApp’s unique distributed content repository, healthcare facilities can apply policy-based retention across entire datastores. Vast stores of medical imagery are safely and compliantly stored. This automated single-point policy simplifies compliance and regulatory audits.

**FlexPod for VNA**

**NetApp partners with Cisco Systems for healthcare storage**

NetApp and Cisco offer a converged platform that is ready for virtualized environments yet is flexible enough to grow to a fully configured private cloud. Their FlexPod unified architecture runs multiple workloads on all protocols and fits right into current infrastructures, leveraging existing resources to minimize or eliminate technology replacement costs. By consolidating legacy and virtualized data into one highly reliable FlexPod data center solution for VNA-enabled systems, healthcare organizations have continuous availability of and protection for all data and medical imaging stores.

FlexPod delivers significant IT, business, and patient benefits. FlexPod:

- Unifies data storage for quicker, more reliable access to patients’ electronically stored X-rays, 3D mammograms, CT scans and MRIs, EHR, pathology, and other data
- Increases productivity of healthcare professionals
- Improves IT access for mobile workers and remote medical facilities
• Enables easier production of storage compliance and audits by standardizing security, retention, and data protection strategies
• Helps healthcare organizations meet new regulatory requirements under the HITECH compliance law, including:
  – Disease management through record and image sharing
  – Clinical decision support through electronic filing using VNA storage support for patients to access their health information electronically, regardless of format
  – More efficient two-way communication with public health agencies through VNA

**Improve Operational Efficiencies**
Through open APIs, FlexPod integrates with existing third-party management, backup, and SRM systems to further streamline data management across complex, distributed healthcare IT environments. Healthcare organizations can maximize utilization and lower the total cost of ownership using FlexPod with existing PACS, VNA, and archiving systems.

**Speed Deployment**
FlexPod provides a unique package of prevalidated storage, networking, and server components optimized for VNA environments that easily integrates into existing network infrastructures. FlexPod:
• Reduces risk with integrated, fully tested technologies
• Meets data growth with the capability to scale without architectural changes to your existing environment
• Supports validated management solutions from trusted partners through open NetApp and Cisco built-in APIs
• Reduces cost, deployment time, and operational processes with built-in efficiencies across all components

![Diagram of FlexPod for VNA configuration.](image)

**Learn More**
To learn more about how FlexPod and VNA storage for healthcare can help you create a more flexible and efficient IT experience that enables you to do more, faster, contact your local NetApp partner or account representative.

**About NetApp**
Leading organizations worldwide count on NetApp for software, systems and services to manage and store their data. Customers value our teamwork, expertise and passion for helping them succeed now and into the future.

[www.netapp.com](http://www.netapp.com)