The Challenge
Healthcare provider organizations remain under pressure to maximize the benefits of their substantial investments in the industry-leading Epic electronic health records (EHRs). As a mission-critical application, Epic has very stringent server and storage infrastructure requirements to ensure:

- High availability
- High performance
- Robust data protection, backup, recovery, and business continuance

Epic users with aging legacy RISC-based infrastructures ready for a refresh can now benefit from an innovative technology solution that increases IT agility, provides seamless scalability, and reduces the cost and complexity of Epic data center operations.

Epic now supports a production target platform consisting of a Cisco® Unified Computing System™ (UCS™) with Intel® Xeon® processors, virtualized with VMware® ESXi™, running Red Hat Enterprise Linux® (RHEL), and coupled with Epic’s High Comfort Level ranking for NetApp® FAS and All-Flash FAS storage. With it, a new era of Epic data center optimization has begun. Using this proven FlexPod® integrated infrastructure, healthcare organizations can expect to see efficiency and productivity improve, while lowering capital and operating expense.

The Solution
**FlexPod—Efficiently Run Epic Software on a Modern Infrastructure**

FlexPod is a proven data center solution offering a flexible, shared infrastructure that easily scales to support growing workload demands and exceeds all performance requirements. By leveraging the FlexPod architecture, this solution delivers these benefits:

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Key Benefits

**FlexPod Datacenter with Epic delivers benefits specific to the healthcare industry:**

**Simplified operations and lower costs**
- Eliminate the expense and complexity of legacy proprietary RISC/UNIX® platforms, replacing them with a much more efficient and scalable shared resource capable of supporting clinicians wherever they happen to be. This solution delivers higher resource utilization for greater return on investment.

**Ability to deploy infrastructure more quickly**
- Whether it’s in an existing data center or a remote location, the integrated and tested design of FlexPod Datacenter with Epic enables customers to have the new infrastructure up and running in less time with less effort.
• Easily accommodate clinical data growth: Dynamically scale virtual machine, server, and storage capacity on demand, without traditional limits.

• Enhance efficiency: Slash both administration time and TCO by up to 50% with a converged virtualized infrastructure that is easier to manage and stores data more efficiently while driving more performance from Epic software.

• Reduce risk: Minimize business disruption with a prevalidated platform built on a defined architecture that eliminates deployment guesswork and accommodates ongoing workload optimization.

Value of Prevalidated, Converged Infrastructures

Epic is very prescriptive as to its customers’ hardware requirements because of an overarching requirement for delivering predictable low-latency system performance and high availability. FlexPod, a prevalidated, rigorously tested converged infrastructure from the strategic partnership of industry leaders Cisco, NetApp, and VMware, is engineered and designed specifically for delivering predictable low-latency system performance and high availability.

The FlexPod solution from Cisco, NetApp, and VMware meets Epic system requirements with a modular, prevalidated, converged, virtualized, efficient, scalable, and cost-effective platform. It provides:

• Modular architecture: FlexPod addresses the varied needs of the Epic modular architecture with purpose-configured FlexPod platforms for each specific workload. All are connected through a clustered server and storage management fabric and cohesive management toolset.

“For standardizing on the FlexPod solution that is easy to implement and maintain, we’re able to maximize our IT team’s impact in bringing greater service agility and functionality to support the needs of GHC-SCW healthcare providers and consumers.”

“We saw the value in standardizing on a single, agile storage infrastructure that could support our expanded Epic software installation, as well as our file-serving and other application environments.”

“We’ve recovered 25% of our data center space, with expectations for that to reach 40% when we’ve completed consolidation. We’ve eliminated IT silos and are benefiting from centralized resource management.”

David Stark
Chief Technology Officer, Group Health Cooperative of South Central Wisconsin

• Accelerated application deployment: The prevalidated architecture reduces implementation integration time and risk to expedite Epic project plans. Whether the solution is used for an initial rollout of Epic, a hardware refresh, or expansion, more resources can be shifted to the business value of the project.

• Industry-leading technology at each level of the converged stack: Cisco, NetApp, VMware, and Red Hat are all ranked as #1 or #2 by industry analysts in their respective categories of servers, networking, storage, and open systems Linux.

• Investment protection with standardized, flexible IT: The FlexPod Reference Architecture anticipates new product versions and updates with rigorous ongoing Interoperability Matrix testing to accommodate future technologies as they become available.

• Proven across a broad range of environments: Pretested and jointly validated with popular hypervisors, operating systems, applications, and infrastructure software, FlexPod has been installed in some of Epic’s largest customer organizations.

FlexPod Cooperative Support

FlexPod Cooperative Support is a partnership between NetApp, Cisco, and our technology partners Microsoft, VMware, Citrix, and Red Hat. It is designed to simplify and streamline support for the FlexPod converged infrastructure.

NetApp and Cisco share a long history of support collaboration for FlexPod, a data center solution that is unified, pretested, and validated. It is a full solution created from best-in-class components coupled with simplified management and validated design guides that create repeatable, scalable deployments for customers and partners.

The Cooperative Support model takes advantage of the combined experience, resources, and technical support expertise of NetApp and Cisco to provide a streamlined process for identifying and resolving a customer’s FlexPod support issue, regardless of where the problem resides.

FlexPod Cooperative Support is especially valuable to healthcare organizations running business-critical applications such as Epic on the FlexPod converged infrastructure.
**FlexPod Datacenter**

The FlexPod Datacenter converged infrastructure includes validated designs for enterprise private clouds as well as application-centric, unified scale-out storage, virtual desktop infrastructure, databases, secure multi-tenancy, business continuity, and data protection.

By replacing aging, legacy RISC/UNIX systems with cost-effective, high-performance solutions based on x86 and the Linux operating system, IT is positioned to achieve cost savings and productivity gains that will help transform IT from a cost center to an innovation center.

**Epic Software on FlexPod**

NetApp and Cisco help healthcare organization upgrade Epic environments to create a cost-effective, efficient foundation. Working together, FlexPod and Epic software can help healthcare providers deliver better patient care through increased uptime and responsiveness, greater scalability, and reduced costs. Providers can then focus on their primary goal: delivering safe, quality patient care. By running the Epic environment on this new foundation, healthcare organizations can expect to see staff productivity improve while lowering capital and operating expenses. Additional benefits of running Epic software on FlexPod Datacenter include:

- **Multi-tenancy**: Supports the increased needs of virtualized server environments, providing secure multi-tenancy and quality of service.
- **Resource optimization**: Can help reduce server counts and boost utilization while improving performance.

**FlexPod Benefits**

- **Industry-standard components**: Combines industry-standard x86-architecture blade and rack servers, networking, storage, and enterprise-class management into a single system running VMware ESXi and Red Hat Enterprise Linux (RHEL).
- **Centralized operations**: Centralized management tools consolidate data in the data center, eliminating the need for data copies, reducing risk, decreasing management overhead, and increasing productivity with the following tools.
- **Programmable configuration**: FlexPod is entirely programmable using unified, model-based management to simplify and accelerate deployment of enterprise-class applications and services running in bare-metal, virtualized, and cloud-computing environments.

**FlexPod Components**

FlexPod Datacenter can be optimized for a variety of mixed workloads in both virtualized and nonvirtualized environments.

**Cisco Unified Computing System**

A self-integrating, self-aware system, Cisco UCS consists of a single management domain interconnected by a unified I/O infrastructure. The system is designed as a single virtual blade chassis that incorporates and scales across multiple blade chassis, rack servers, and racks. The system implements a radically simplified architecture that eliminates the multiple redundant devices that populate traditional blade server chassis and result in layers of complexity: Ethernet switches, Fibre Channel switches, and chassis management modules. Cisco UCS consists of a redundant pair of Cisco 6200 Series Fabric Interconnects.

Figure 1) FlexPod Datacenter is optimized for Epic workloads.
that provide a single point of manage-
ment and a single point of control for all I/O traffic.

**Cisco Nexus**

UCS integrates computing resources with Cisco Nexus® switches and a unified I/O fabric that identifies and handles different types of network traffic, including storage I/O, streamed desktop traffic, management, and access to clinical and business applications. All Cisco UCS servers are stateless. Service profiles automate the build process for each server and simplify failure recovery.

**NetApp FAS8000 Storage**

Fabric-attached storage (FAS) 8000 storage systems reduce overall storage costs while delivering the low-latency read and write response times and IOPS required for Epic workloads. FAS8000 storage systems support both all-flash and hybrid storage configurations to create an optimal storage platform to meet Epic requirements. NetApp flash-accelerated FAS8000 systems received the Epic High Comfort Level rating, providing Epic customers with the performance and responsiveness key to Epic operations.

NetApp FAS storage offers features that are extremely useful in Epic environments, simplifying management, increasing availability, and reducing the total amount of storage needed:

- **Storage efficiency:** Reduce total capacity requirements with deduplication, compression, and thin provisioning.
- **Space-efficient cloning:** The NetApp FlexClone® capability allows you to almost instantly create readable/writeable database copies. These clones consume incremental additional storage only as incremental changes are made.
- **Integrated data protection:** Full data protection and disaster recovery features help customers protect critical data assets and provide disaster recovery.
- **Nondisruptive operations:** Upgrading and maintenance can be performed without taking data offline.

**VMware vSphere ESXi**

The VMware vSphere® hypervisor is the industry-leading hypervisor that virtualizes servers and consolidates applications on less hardware.

- **Built-in management tool:** Create and provision virtual machines easily and within minutes.
- **Storage usage efficiency:** Over-allocate storage resources beyond the actual capacity of the physical storage.
- **Advanced memory management:** Overcommit memory resources and perform page sharing and compression to optimize performance of memory resources.
- **Hardened drivers for high reliability:** Enable optimal performance for the vSphere hypervisor through partnerships with independent hardware vendors.

**Red Hat Enterprise Linux**

Red Hat Enterprise Linux 6 on VMware ESXi 5.5 on Xeon processors is a supported InterSystems Operational Caché Database Platform. RHEL 6 is designed to be the world’s leading enterprise-focused open source operating system platform. It includes a comprehensive set of features that span from midlevel servers to the largest enterprise data center environment.

**FlexPod Reseller Partners**

FlexPod Premium Partners are an elite group of Cisco and NetApp resellers who have been recognized for the depth and breadth of their FlexPod expertise. They offer a comprehensive suite of FlexPod system integration and implementation services applicable to the entire FlexPod Datacenter lifecycle.

FlexPod Premium Partners orchestrate a master implementation plan, including Epic-specific and Epic-experienced resources through Cisco and NetApp.

Engaging a FlexPod Premium Partner for a data center deployment can help IT departments reduce risk, customize their FlexPod solution, and accelerate time to production availability.