FlexPod Datacenter for Epic EHR Infrastructure

Efficiencies and Cost Savings for Demanding Healthcare Workloads
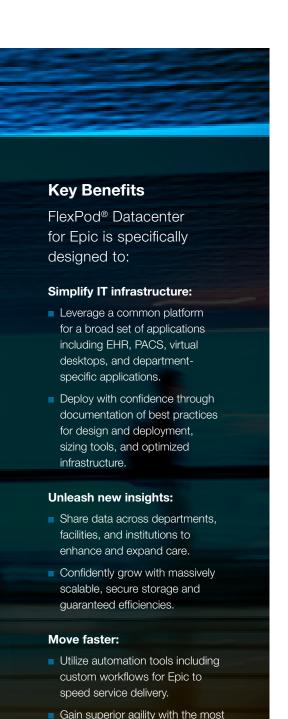
The Challenge

Healthcare provider organizations remain under pressure to maximize the benefits of their substantial investments in 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 supports a production target platform consisting of a Cisco Unified Computing System (Cisco 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 AFF 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

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. The FlexPod platform brings Epic solutions a platform that is market proven with thousands of active FlexPod customers, a robust channel of delivery partners, and the transfer of best practices for implementation of a data center platform from market leaders. The FlexPod Datacenter for Epic EHR infrastructure is designed to simplify IT infrastructure, help healthcare organizations unleash new insights from their data, and move their IT projects faster with automation and cloud-connected infrastructure.

FlexPod for Epic improves patient care by simplifying and accelerating the deployment of critical healthcare applications. The FlexPod platform is prevalidated for, aligned with, and supported by Epic best practices, meeting stringent requirements for low-latency system performance and high availability. Consolidate infrastructure by leveraging a common platform for a broad set of applications including EHR, PACS, virtual desktops, and department-specific applications. The platform scales up or out to meet the considerable growth needs of healthcare data and new applications. FlexPod adapts easily to changing applications and growth, future-proofing your infrastructure investment without forklift upgrades. The power of FlexPod is working to help save lives in several Epic environments worldwide.

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 and NetApp, 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:

■ Flexible design with a broad range of reference architectures and validated designs

■ Elimination of costly, disruptive downtime through ONTAP®

■ Pervasive simplicity and agility with the software-driven architecture and high performance of Cisco UCS compute

■ Cisco ACI for centralized, policy-driven automation that accelerates application deployments

■ Multiprotocol FAS storage platform that unifies application silos, allowing NAS or SAN, file or block storage, on one converged platform

■ Support for private, public, or hybrid cloud strategies with a consistent set of data management tools for edge, private, and public clouds

■ Automation for rapid installation and delivery of new services

FlexPod Cooperative Support speeds problem resolution

FlexPod Cooperative Support is a partnership between NetApp; Cisco; and our technology partners Microsoft, VMware, Citrix, and Red Hat. Your IT staff chooses which vendor to call based on your initial assessment of the problem's origin. Knowledgeable FlexPod engineers work to resolve your issue quickly using shared communications, expertise gained through ongoing joint training, and a formal escalation process. The result is a rapid resolution to your technical issues.

FlexPod Datacenter

The FlexPod Datacenter solution includes validated designs for enterprise private clouds as well as application-centric, unified scale-out storage, virtual desktop infrastructure, databases, secure multitenancy, 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 organizations 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:

- **Multitenancy.** Supports the increased needs of virtualized server environments, providing secure multitenancy and quality of service.

- **Resource optimization.** Can help reduce server counts and boost utilization while improving performance.

- **Agility.** Reduces complexity and costs, giving organizations greater agility to provision new database replications and environments to support initiatives such as population health management.

- **Productivity.** Can be deployed quickly and can speed Epic applications, greatly reducing login times, system response times, and other user interactions.

- **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).

Best-in-Class Components for Enhanced Data Center Efficiency

FlexPod components are integrated in a standardized configuration that scales from entry-level designs for hundreds of users up to high-performance big data workloads for thousands of users. This integrated approach can significantly reduce your capital and operating expenses through end-to-end virtualization and higher efficiencies at each layer.

Cisco Unified Computing System

Cisco UCS offers a software-driven architecture that delivers pervasive simplicity and operational agility. It combines compute and network resources, storage access, and virtualization into a scalable, modular system that is easily managed as a single entity by Cisco UCS Manager. Cisco UCS servers simplify your data center architecture by reducing the number of devices to purchase, deploy, and maintain and improving speed and agility for application deployments.

The Cisco UCS system is versatile. It simultaneously supports unique performance and scale requirements of various applications using a common management and resource model. Service profile templates enable automatic, policy-based hardware configuration and deployment for large, stateless computing environments. The fifth-generation Cisco UCS server platforms support the new Intel Xeon scalable processors, delivering faster CPUs and memory with increased core counts. Producing six new industry standard world records, the Cisco UCS M5 server portfolio continues to perform and innovate with broad support for NVMe and industry-leading GPU density, particularly in blades, where Cisco offers the only half-width blade in the industry with dual GPU support. These innovations allow customers to address general compute infrastructure as well as VDI, real-time analytics, deep learning, and machine learning with a common system-based approach: Cisco UCS.

Cisco Data Center Switches

Cisco Nexus data center switches are built for scale, industry-leading automation, programmability, and real-time visibility. The Cisco Nexus 9000 series offers high performance, low density, low latency, and power efficiency that are taken to new levels with cloud-scale ASIC technology. Cisco Nexus 9000 switches also lay the foundation for software-defined innovations such as Cisco Application Centric Infrastructure (ACI), allowing intelligent software to automate hardware resources across next-generation data centers. Cisco Nexus switches also offer options for unified fabric technology to identify and consolidate all network traffic onto a single simplified, cost-effective architecture based on FC over Ethernet. Dedicated FC support is available through Cisco MDS switches, which offer high-performance SAN extensions and reliable integration into existing SAN environments.

NetApp Storage

NetApp AFF and FAS storage systems:

- **Reduce the cost and complexity** for virtualized infrastructures by meeting all of your storage requirements with a single, highly scalable solution.

- **Support all protocols,** so you no longer need to purchase separate systems to accommodate different storage needs.

- **Offer a guaranteed workload-specific effective capacity** with the NetApp all-flash guarantee.

- **Enhance operational efficiency** with automated storage management, data protection, and security.

- **Bring new levels of nondisruptive operations, scalability, and efficiency** to enterprise storage with the ONTAP operating system.

AFF performance is optimized with innovative flash technologies and 40GbE, FCoE, and FC support. At up to 7M IOPS per cluster with submillisecond latency, NetApp AFF systems are the fastest all-flash arrays built on a true unified scale-out architecture. With storage based on NetApp ONTAP storage, you can deploy the exact proportion of flash to spinning media for your particular environment and use a single storage operating system for flash, disk, and cloud storage.

AFF storage systems reduce overall storage costs while delivering the low-latency read and write response times and IOPS required for Epic workloads. NetApp AFF systems received the Epic High Comfort Level rating, providing Epic customers with the performance and responsiveness key to Epic operations. In addition to these features, 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/writable 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 in minutes.

- **Storage usage efficiency.** Overallocate 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 7.4 on VMware ESXi 6.5 on Xeon processors is a supported InterSystems Operational Caché Database Platform. RHEL 7 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.