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# Run Critical Healthcare Workloads with Confidence

**A powerful, affordable, and highly available platform for scalable, data-intensive computing lets healthcare providers thrive in a data-enabled, value-based healthcare environment.**

This solution brief describes how to solve business challenges and enable digital transformation through investment in innovative technologies.

If you are responsible for...

- **Business strategy:**
  You will better understand how a critical healthcare workloads solution will enable you to successfully meet your business outcomes.

- **Technology decisions:**
  You will learn how a critical healthcare workloads solution works to deliver IT and business value.

## Executive Summary

From regulatory changes to demographic trends, health systems face pressure to deliver higher-quality, coordinated, and cost-effective care. As a result, both the volume of medical data and the number of simultaneous user requests against the healthcare database are soaring.

A new generation of technologies from Intel and VMware offers significant advances in scalable, high-throughput solutions for electronic health record (EHR) platforms.

Health systems still using legacy RISC-based platforms can gain several key benefits by migrating to an Intel® architecture-based EHR platform, including ease of management, enhanced reliability, and lower cost. Those already using an x86-based platform can gain considerable performance by upgrading to the latest generation of processor. In either case, customers using the solution can scale up with a smaller data center footprint which translates to a lower total cost of ownership.

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**Patient Transactions Per Second**[1]
Higher is Better
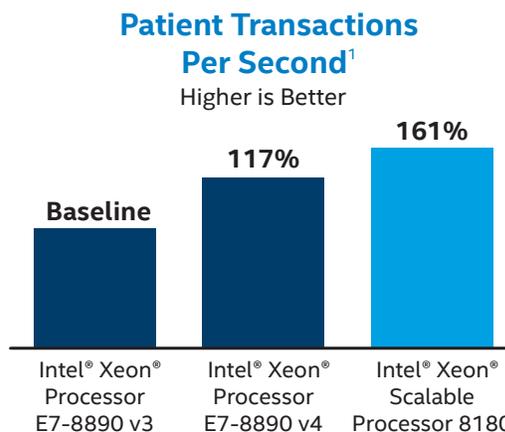


61%

**Increase in Patient Data in the Same Amount of Time Using the Latest Generation of x86 Architecture**

**Figure 1.** Upgrading to the latest generation of x86 architecture enables electronic health record systems to access more patient data in the same amount of time.

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**Solution Benefits**

- Increased performance
- Decreased data center footprint
- Lower cost enterprise-level reliability
- Simplified platform manageability

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## Business Challenge: Performance, Scalability, and Manageability

To cope with shifting regulatory and reporting requirements, a more complex healthcare ecosystem, intense cost pressures, and higher patient loads, health systems around the world are expanding and consolidating to achieve economies of scale and focusing on team-oriented services and collaboration. These changes have dramatically impacted electronic health record (EHR) platforms and healthcare databases, which must maintain responsiveness while handling more concurrent users, more diverse workflows, and a greater range of application functionality.

The result of these changes is two-fold. Platform and database scalability is more crucial than ever to help achieve optimum patient care and provider productivity, and to help ensure enterprise success. In addition, health systems still using legacy RISC-based hardware are looking for ways to run their EHR platform on a more cost-effective and manageable infrastructure.

## University Health Upgrades EHR System

Seeking reduced total cost of ownership and a more scalable, sustainable infrastructure, IT leaders at Shreveport-based University Health System (UHS) migrated from their legacy RISC-based platform in 2015 to an open standards-based platform powered by the Intel® Xeon® processor E7 and Intel® Xeon® processor E5 families. Reliability was one of UHS Executive Director of IT Greg Blanchard's top concerns. "Using Intel® hardware… you can provide a level of reliability that's better than or equal to anything out there. You can do it more easily and at much lower cost. It's going to make your life a lot easier," Blanchard said.[2]

UHS found it easy to transition from a RISC-based platform to an Intel® architecture-based platform because it was already performing many other tasks on similar Intel architecture—no training or additional work was necessary. Acquisition costs for the system were less than 50 percent of what it would have taken to refresh the RISC platform.[3] Since installing the system,

UHS' EHR has exhibited a 40-percent faster response time with the same level of reliability as before. The IT team also reports that they have had zero incidents and zero down time.

## Solution Value: Lower Cost with Higher Productivity

A new generation of Intel's most robust server processors provides exceptional performance, scalability, reliability, and manageability to help health systems drive down the total cost of ownership and increase productivity:

- **Refresh hardware to increase performance.** Running modern EHR and relational database management system (RDBMS) software and VMware vSphere* on an Intel® Xeon® Scalable 8180 processor resulted in a 38-percent throughput improvement compared to the same workload running on the previous generation of the same processor (as measured by database accesses per second).[4]

- **Decrease data center footprint with scalability.** The Intel architecture-based platform is designed for scalability. With up to 28 physical cores per CPU supporting 108 vCPUs per virtual machine, the Intel Xeon Scalable 8180 processor has the capacity to help even the largest health system scale up large data loads with a smaller data center footprint, which translates to lower TCO.

- **Provide enterprise-level reliability at a lower cost.** The Intel Xeon Scalable processor family offers an extensive and robust set of reliability, availability, and serviceability features to provide error detection, correction, containment, and recovery in all processors, memory, and I/O data paths. The Intel Xeon Scalable processor family delivers all these features at a highly competitive price point and power consumption level compared to traditional RISC-based solutions. Solution reliability is increased further by VMWare vSphere, which provides high availability and Distributed Resource Scheduling.

- **Simplify platform manageability.** Finding administrators who are familiar with RISC-based platforms is becoming more difficult. In addition, health systems struggle with managing multiple disaster recovery protocols across various platforms in their data center. Many health systems are standardizing their data centers on x86 architecture because it is easy to find qualified administrators who can manage this platform and software ecosystem. Since IT staff and users are familiar with Intel architecture-based platforms, installation is quick, training needs are minimal, and disaster recovery is simplified.

"Using Intel® hardware… you can provide a level of reliability that's better than or equal to anything out there. You can do it more easily and at much lower cost. It's going to make your life a lot easier."[5]

—Greg Blanchard
UHS Executive Director of IT

An added benefit of the x86 architecture-based solution is that it uses industry-standard hardware and software. Upgrading proprietary RISC-based platforms can be expensive, and integrating such a platform with other products can be challenging. In contrast, an x86 architecture-based EHR platform enables customers to choose their hardware and software suppliers. An open, industry-standard ecosystem helps reduce costs and accelerate innovation by offering a broad choice of applications, tools, and peripherals.

By cost-effectively scaling their databases with the Intel Xeon Scalable processor family, health systems can position themselves to deliver outstanding care for their patients and thrive in the fast-changing new world of healthcare.

## Solution Architecture:
## Intel® Architecture-Based EHR Solution

The solution architecture for an x86-based EHR database tier includes the Intel Xeon Scalable family, an RDBMS, and VMware vSphere 6.5 virtualization software, all running on Red Hat Enterprise Linux* (see Figure 2).

Each component of the Intel architecture-based solution is designed for the most demanding, business-critical computing workloads, to deliver high performance and scalability.

- **Intel Xeon Scalable processor family.** Available with up to 112 cores in a four-socket system and over 50 percent increase in memory bandwidth,[4] it improves scalability through high performance and an increased range of I/O enhancements. Meeting the highest enterprise requirements for reliability and uptime, it includes more than 72 reliability, availability, and serviceability features.

- **VMware vSphere 6.5.** An industry-leading virtualization platform, vSphere features increased scalability; expanded support for the latest x86 chipsets, devices, drivers, and guest operating systems; virtual machine-aware external storage arrays; and network and workload manageability improvements.

- **Red Hat Enterprise Linux 7.** A leading open source platform for modern data centers, this OS delivers high levels of security and uptime and supports business-critical workloads. OS features can help lower the total cost of ownership, improve IT efficiency, and improve virtualization infrastructure.

- **Intel® Ethernet Converged 10/25/40GbE Network Adapters.** Innovative features of Intel Ethernet Converged Network Adapters provide a high level of performance while consuming half the power of that of the previous generations. For example, the ability to distribute network traffic across multiple CPU cores results in near-native support in virtualized environments. This includes support for next-generation network virtualization standards such as VXLAN, NVGRE, NSH Offload, and Geneve.

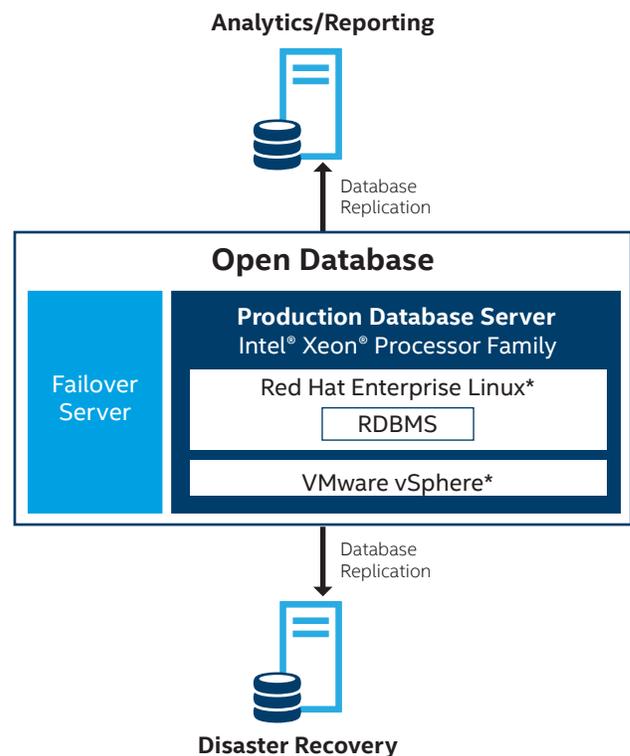### Solution Architecture for the Open Database Production Server



**Figure 2.** The solution architecture for the database tier for running EHR software on x86 architecture includes a powerful Intel® Xeon® processor, the Red Hat Enterprise Linux* OS, a relational database management system (RDBMS), and VMware vSphere*.

## Moving Forward with Confidence on a Sustainable Foundation

The Intel Xeon Scalable processor family gives health systems the sustainable foundation they need to address their challenges and make the most of market opportunities, regardless of their current EHR platform:

- Refreshing an older Intel architecture-based platform enables customers to improve performance and scale up with a smaller data center footprint. By taking advantage of the platform's headroom and scalability, they can accommodate larger patient volumes and a higher volume of user requests against the database on a single affordable scale-up platform.

- Compared to legacy RISC-based systems currently in use at many hospitals, the Intel architecture-based platform simplifies management, enhances reliability, cuts costs, and improves supplier choice through the use of industry-standard hardware and open source software.

The increased performance and scalability of Intel's solution illustrates the synergies that can result when technology innovators collaborate to optimize their solutions and address customer requirements. Whether refreshing or migrating their EHR platform, customers can look forward to a lower total cost of ownership.

Find the solution that's right for your organization. Contact your Intel representative or visit **intel.com/healthcare**.

### Learn More

You may also find the following resources useful:

- Intel Xeon Scalable processor family
- VMware vSphere

### Solutions Proven By Your Peers

Intel Solution Architects are technology experts who work with the world's largest and most successful companies to design business solutions that solve pressing business challenges. These solutions are based on real-world experience gathered from customers who have successfully tested, piloted, and/or deployed these solutions in specific business use cases. Solution architects and technology experts for this solution brief are listed on the front cover.