Solution Brief

Medical Record Databases

Intel® Xeon® Scalable Processors Deliver Up to 119% ROI over Five Years for Epic Deployments[1]

Take advantage of recent licensing changes and sunsetting of InterSystems Caché to easily transition to Intel® architecture—and potentially save millions (USD) compared to a RISC-based deployment.

Electronic medical record (EMR) databases are the backbone of patient services delivery and traditionally rely on siloed AIX-based servers with high operational costs for proprietary software licenses. Until recently, the ability to migrate to a Linux-based platform has been cost prohibitive because of relicensing penalties.

"Moving from the Intel® Xeon® Platinum 8280 processor running Caché to the Intel® Xeon® Platinum 8380H processor running IRIS, we saw the scalability of a single operational database server increase by 20 percent.[2] With these gains, we expect our customers to scale further with a lower data center footprint and lower TCO."

—Epic

Opportunity: Eased migration costs offer a path to low TCO and high ROI

Now that Epic is sunsetting the InterSystems Caché database management system and waiving relicensing fees to convert from AIX to Linux, healthcare organizations can migrate to Intel-based servers and realize CapEx savings and OpEx efficiencies. According to a recent ROI analysis, Intel-based servers offer substantial cost advantages[1] when compared to as-is RISC deployments or a RISC-based refresh, in addition to other key benefits.

Benefits of Intel-based Epic deployments

- Fewer higher-density Intel-based servers and software licenses to maintain
- Support for up to tens of millions of global references per second (GREFs)[2] for scale-out deployments
- Access to a bigger talent pool of x86-trained engineers and developers
- Broader choice of OEM and ISV partners, including Cisco, Dell, HPE, Lenovo, Nutanix, Red Hat, and VMware

Solution: Break proprietary vendor lock-in with Intel® Xeon® Scalable processor-based servers

Epic deployments with Intel-based servers can allow healthcare organizations to recoup their investment within a 58-month payback period, achieving 119 percent ROI within five years.[1] Much of the value of the solution is conveyed through powerful, high-utilization servers that can support up to tens of millions of GREFs while depending on fewer servers, fewer proprietary software licenses, and fewer full-time equivalent (FTE) staff to maintain those servers.

How it works: Low entry cost that surpasses as-is configurations

Analysis shows that over a five-year period, an Intel-based deployment costs approximately 8 percent less to maintain compared to as-is RISC-based deployments. When compared to a RISC-based upgrade, the USD cost savings are even more apparent, with an advantage of up to USD 7.46M for Intel-based servers (see Figure 1).[1] A great portion of this cost is tied to propriety software licenses for AIX-based servers, which impose recurring licensing fees of hundreds of thousands of dollars annually.

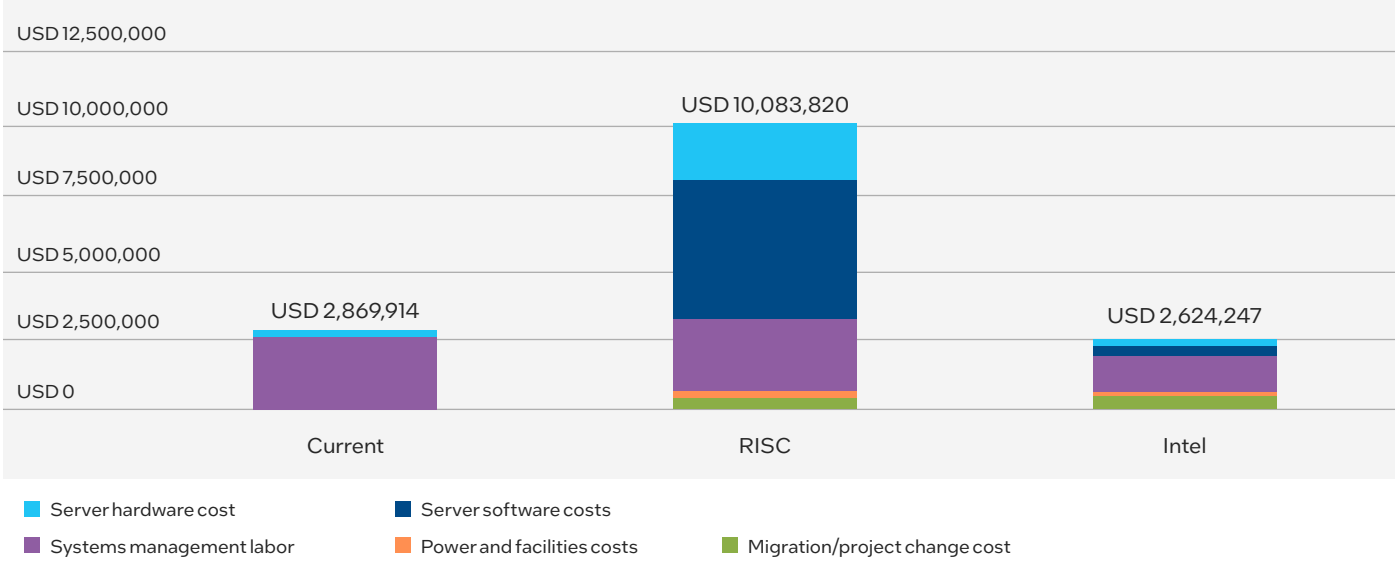


Figure 1: Five-year aggregated costs of as-is RISC deployments compared to a RISC-based refresh vs. an Intel-based refresh.

Investment payback in a five-year period

The analysis also highlights that initial technology investments for Intel-based Epic deployments can achieve a payback period as quickly as 58 months, and a full five-year period can yield a positive ROI of up to 119 percent (see Figure 2).[1] Healthcare organizations can realize the flexibility and scalability of an Intel-based Epic solution fast while having confidence that their investment will provide an advantage in dealing with future challenges and budget constraints.

Laying a hyperconverged infrastructure (HCI) foundation

Intel® hardware enables devices and systems throughout the healthcare environment, from edge to cloud. However, AIX-based EMR databases are siloed from the greater ecosystem and necessitate the hiring or training of AIX-specialized talent to keep systems running optimally. By migrating to Linux-based EMR databases, hospitals can consolidate most, if not all, of their infrastructure onto familiar x86 devices and systems. This consolidation can help hospitals streamline their IT department FTE costs and help lay the foundation for hyperconverged infrastructure (HCI) projects. Successful HCI deployments offer the benefit of single-pane-of-glass orchestration for end-to-end, edge-to-cloud IT infrastructure across the hospital network.

Financial analysis	
Total five-year investments	USD 1,265,177
Total five-year benefits	USD 1,510,844
Net present value (NPV)	USD 74,858
Return on investment (ROI)	119%
Payback period (months)	58

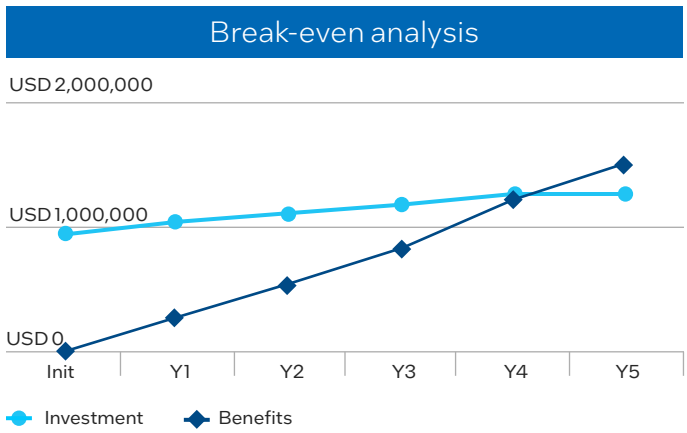


Figure 2: Five-year technology investments compared to value received for Intel-based Epic systems.[1]

Reliability across compute, storage, and networking

Intel Xeon Scalable processors help healthcare organizations meet their GREF requirements for deployments of any size. However, to keep data moving fast and prevent underutilization or system bottlenecks, IT departments can also consider strategic improvements to storage and networking layers. Intel® Optane™ SSDs deliver high-capacity NVMe storage with PCIe interfaces for fast I/O with a direct connection to the CPU. Intel® Ethernet 800 Series network adapters bring 100GbE connectivity at low latency to support data portability from edge to cloud, within the hospital environment. Together, these improvements help deliver high uptime and reliability to help ensure data accessibility for clinicians and practitioners.

Conclusion: Intel enables Epic deployments of any size

For either SMP or ECP deployments, Intel Xeon Scalable processors support tens of millions of GREFs at a competitive price point and up to 119 percent ROI.[1] Now that migration costs are no longer a barrier to entry, it's the perfect time to convert to Intel-based database servers and take advantage of the performance and efficiency improvements that Intel has to offer.

Get a custom ROI analysis today

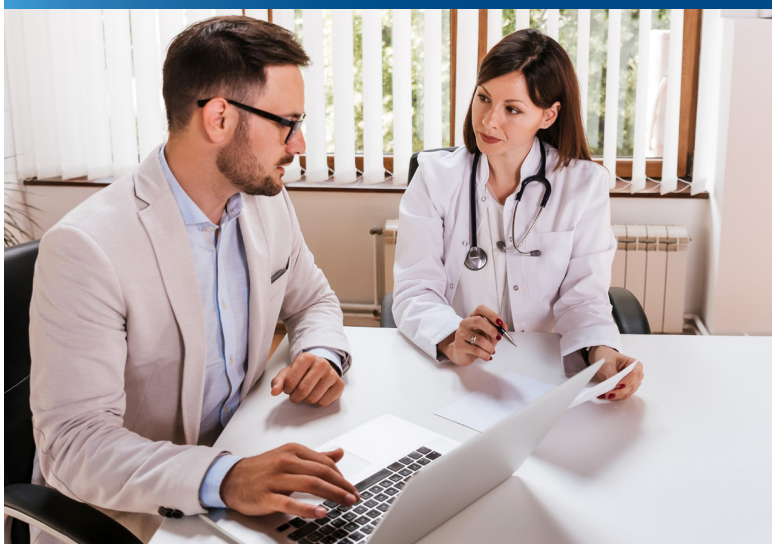
Measure the impact of deploying Intel Xeon Scalable processors for your Epic systems and ask about special pricing to make your move as cost-effective as possible.

Schedule a call for your custom ROI analysis.

Get special pricing for your migration to Intel

Businesses may be eligible for meet-comp pricing for Epic-certified Intel Xeon Scalable processors when migrating from an AIX-based system, for either Caché or IRIS database deployments. Special pricing is considered on a case-by-case basis and is not guaranteed.

Contact your Intel sales representative to learn more.



Analysis details

Current as-is opportunities

The proposed business case is focused on consolidating the following servers:

Server Type	Server Count	Average Server Age	Average Sockets per Server	Average Purchase Price per Server
IBM Power System S824 (P8 4.1 GHz) (2ch x 8co)	6	1.9	2	USD 53,227
Average server replacement period (years)				4.0
Data center cooling efficiency factor (PUE)				2.0

The details on the predominantly used software packages are as follows:

Predominant Package Type	Server Count	Average Sockets per Server	Average Cores per Server	Average One-Time License Cost per Server	Average Recurring License Cost per Server
Primary operating system: IBM AIX	6	2	16	USD 8,000	USD 2,277
Virtualization software: IBM PowerVM	0	0	0	USD 0	USD 0
Cluster software: IBM Power HA	0	0	0	USD 0	USD 0
Other software	0	0	0	USD 0	USD 0

Proposed Intel® Xeon® Scalable processor-based environment

Recommendation	Servers	Quantity Chips/ Sockets per Server	List Price per Server	Net One-Time Cost	Annual Recurring Costs
Server: Dell PE R940 (Intel® Xeon® 8280 2.7 GHz) (4ch x 28co)	5	4	USD 62,519	USD 312,596	USD 0
Operating system: Red Hat Linux	5		USD 0	USD 0	USD 1,299
Virtualization software: VMware vSphere	5	4	USD 11,556	USD 57,780	USD 14,445
Database: InterSystems Caché				USD 0	USD 0
Other software	0		USD 0	USD 0	USD 0

Recommendation	Quantity	List Price per Unit	Net One-Time Cost	Annual Recurring Costs
Hardware installation	3	USD 800	USD 2,400	USD 0
Software implementation	3	USD 0	USD 0	USD 0
Total			**USD 372,776**	**USD 15,744**
Discount for initial hardware purchase				0.0%

Alternative new RISC-based solution

Recommendation	Servers	Quantity Chips/ Sockets per Server	List Price per Server	Net One-Time Cost	Annual Recurring Costs
Server: IBM Power System E880 (P8 4.35 GHz) (2ch x 32co)	5	160	USD 386,743	USD 1,933,715	USD 0
Operating system: IBM AIX	5		USD 16,000	USD 80,000	USD 113,864
Virtualization software: IBM PowerVM	5	160		USD 89,600	USD 23,307
Database: Intersystems Caché				USD 0	USD 0
Cluster software: IBM Power HA	5	160	USD 107,520	USD 537,600	USD 67,680
Other software	0		USD 0	USD 0	USD 0

Recommendation	Quantity	List Price per Unit	Net One-Time Cost	Annual Recurring Costs
Hardware installation	3	USD 800	USD 2,400	USD 0
Software implementation	22	USD 0	USD 0	USD 0
Total			**USD 2,643,315**	**USD 204,851**
Discount for initial hardware purchase				0.0%

Five-year financial analysis

Five-Year Cost Comparison	Current Environment	New RISC Environment	New Intel® Xeon® Environment
Server hardware costs	USD 213,318	USD 1,936,115	USD 314,996
Server software costs	USD 68,310	USD 4,804,220	USD 372,660
Systems management labor	USD 2,525,286	USD 2,525,286	USD 1,262,650
Power and facilities costs	USD 63,000	USD 269,690	USD 94,020
Migration/project change costs	USD 0	USD 548,509	USD 579,921
Total	**USD 2,869,914**	**USD 10,083,820**	**USD 2,624,247**

Current vs. New Intel-Based Solution	Current Environment	New Intel® Xeon® Environment	Savings with New Intel Xeon	Savings %
Server hardware costs	USD 213,318	USD 314,996	-USD 101,678	-47.67%
Server software costs	USD 68,310	USD 372,660	-USD 304,350	-445.54%
Systems management labor	USD 2,525,286	USD 1,262,650	USD 1,262,636	50.00%
Power and facilities costs	USD 63,000	USD 94,020	-USD 31,020	-49.24%
Migration/project change costs	USD 0	USD 579,921	-USD 579,921	0.00%
Total	**USD 2,869,914**	**USD 2,624,247**	**USD 245,667**	**8.56%**

Current vs. New RISC Server	Current Environment	New RISC Environment	Savings with New RISC	Savings %
Server hardware costs	USD 213,318	USD 1,936,115	-USD 1,722,797	-807.62%
Server software costs	USD 68,310	USD 4,804,220	-USD 4,735,910	-6,932.97%
Systems management labor	USD 2,525,286	USD 2,525,286	USD 0	0.00%
Power and facilities costs	USD 63,000	USD 269,690	-USD 206,690	-328.08%
Migration/project change costs	USD 0	USD 548,509	-USD 548,509	0.00%
Total	**USD 2,869,914**	**USD 10,083,820**	**-USD 7,213,906**	**-251.36%**

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1. Intel internal measurements based on Migration TCO Calculator as of 2019. Configuration 1 details: 5x Dell PE R940 servers with 4x Intel® Xeon® Platinum 8280 processors per server (28 cores per socket, 560 cores total); OS: Red Hat Linux; SW: VMware vSphere; DB: InterSystems Caché. Configuration 2 details: 5x IBM Power System E880 servers; OS: IBM AIX; SW: IBM PowerVM, IBM Power HA; DB: InterSystems Caché.
2. Up to 12M GREFs for SMP Caché deployments using Intel® Xeon® Platinum 8280 processors and up to 14.9M GREFs for SMP IRIS deployments using Intel® Xeon® Platinum 8380H processors. Testing conducted comparing Intel® Xeon® Processor E7-8890v3, Epic 2014, and Caché 2015.1 to Intel® Xeon® Processor E7-8890v4, Epic 2014, and Caché 2015.1 to Intel® Xeon® Platinum 8180 processor, Epic 2017, and Caché 2016.1 to Intel® Xeon® Platinum 8280 processor, Epic 2018, and Caché 2017.1, Intel® Xeon® Platinum 8380H processor, Epic 2019, and IRIS 2020.1. Testing performed by Epic measuring GREF performance.

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