



Maximizing ROI for Epic* and Caché* with Intel® Technologies in the Data Center

Hackensack University Medical Center (HackensackUMC) reduces platform total cost of ownership (TCO) nearly 50 percent by standardizing on Intel technologies



Shafiq Rab, MD, vice president and CIO of HackensackUMC, is a man with a passionate belief in the need to transform healthcare. He's counting on Intel to help him do it. HackensackUMC is standardizing on Intel® technologies, establishing a private cloud environment, and migrating mission-critical software such as the Epic* electronic health record (EHR) suite and InterSystems Caché* database from RISC platforms onto a virtualized environment based on Intel technologies. Dr. Rab says the resulting performance, agility, and economies of scale will help HackensackUMC fulfill what he calls "an ethical, moral duty" to deliver high-quality, cost-effective healthcare.

Challenges

- **Infrastructure for top-quality care.** HackensackUMC's IT team must provide a robust, cost-effective, and highly available infrastructure to support the medical center's mission to deliver world-class patient care.
- **New opportunities, more data.** Genomics breakthroughs and changes in the healthcare environment are dramatically increasing the amount of data to manage, analyze, apply, and store.

Solutions

- **High-performance platforms.** Cisco Unified Computing Systems* (UCS*) B220 blades powered by the Intel® Xeon® processor E5-2600 product family with Intel® Ethernet Converged Network Adapters, Red Hat Enterprise Linux*, and VMware ESX*.
- **Enterprise storage.** EMC Symmetrix VMAX 40K* enterprise-level storage arrays with intelligent controllers based on the Intel Xeon processor E5 family.
- **Integrated security.** McAfee enterprise security solutions.

Technology Results

- **Performance, scale, and availability.** Using virtualization and the Intel Xeon processor E5-2600 product family, HackensackUMC gains a high-performance environment with easier scalability, outstanding availability, and improved disaster recovery (DR). HackensackUMC also reduced its server footprint by 70 percent, freeing valuable space in the data center.
- **Savings.** HackensackUMC IT leaders say their Caché migration platform reduces TCO up to 50 percent and saves another 40 to 50 percent on hardware, software, and operating system support.
- **Personnel.** By eliminating the need to support multiple operating systems and platforms, IT can concentrate its staff on more strategic assignments.

Business Value

- **Empowering world-class healthcare.** HackensackUMC's future-facing environment enables IT to make the most of new data sources and rapidly deploy innovative capabilities and applications. This empowers HackensackUMC to deliver higher-quality and more collaborative care, apply genomics breakthroughs, train the next generation of health professionals, and reduce healthcare costs.



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– Shafiq Rab, MD,
Vice President and CIO,
HackensackUMC

Intel technologies help HackensackUMC deliver great care and manage explosive data growth



"We are seeing huge, significant savings on hardware and support costs that pay off the investment very quickly. In addition to the cost savings, we get all the invisible benefits, like faster turnaround and greater productivity. We save on people skills. We can focus our people to be experts in one environment and go with it. There's a whole chain effect that ends up with HackensackUMC being more competitive and delivering better care."

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Manager of Infrastructure and
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Leaders in a Highly Competitive Region

HackensackUMC is a 775-bed nonprofit teaching and research hospital and the largest provider of inpatient and outpatient services in New Jersey. Combining exceptional patient care with medical education and innovation, HackensackUMC is New Jersey's top-ranked hospital. It's also the third-highest-ranked hospital in the hospital-dense New York/New Jersey/Connecticut tri-state area—a notch up from its fourth-place spot in 2012.¹

As a physician-CIO, Dr. Rab is well positioned to lead HackensackUMC into the fast-changing world of healthcare reform, personalized medicine, team-oriented care, and predictive diagnostics. He's clear on both the need to transform healthcare and the crucial role IT must play in the transformation.

"It is our ethical, moral duty as a generation to bring down the cost yet increase the quality of healthcare," Dr. Rab says. "Our job in IT is to provide the right information at the right time for the right person to do the right thing for the right patient in a secure way. We need to analyze each interaction to understand the implications—for the individual patient, the community, the whole nation, and the whole spectrum of the disease. We are just in the rudimentary phase."

Standardizing on Intel technologies and creating an enterprise private cloud are key steps in equipping HackensackUMC to fully benefit from next-generation hybrid cloud environments and more collaborative, data-driven approaches to healthcare. "Intel provides the pathway to get us to the economies of scale," says Dr. Rab. "Intel provides the vehicle that allows us affordability, scalability, and standardization at lower cost. At the same time, Intel provides the high performance that we need."

Relieving the Pain of RISC

HackensackUMC's IT leaders say the move to Intel-based platforms is a strategic one that relieves the pain points of a RISC environment and sets a course for the future. "On the RISC platform, we had higher costs on hardware, software, maintenance, and people skills," says Prisco Lamdagan, Jr., manager of infrastructure and engineering at HackensackUMC. "We also had to maintain a separate process for disaster recovery and business continuity. It was an expensive solution."

Now, HackensackUMC is using the Cisco UCS platforms with Intel technologies to run the Epic EHR, Caché database, PeopleSoft Human Capital Management* (HCM*), and other software. The Cisco platforms incorporate the Intel Xeon processor E5-2600 product family and Intel Ethernet Converged Network Adapters, providing a scalable, high-throughput solution that increases density, simplifies deployment and management, and reduces TCO.

"Running Epic and Caché on Intel technologies and using virtualization gives us a converged infrastructure that adds stability and consistency to our environment," Lamdagan says. "It elevates the redundancy and availability and allows us to move workloads between servers more easily. It makes us highly scalable, so we can address the ever-growing expansion of data and compute resources. We have the scalability to meet the next wave of requirements and the agility to address them swiftly. We also have a consolidated DR solution, which is an important factor in delivering patient care."

With Intel Technologies: 'Huge, Significant Savings'

The Intel-based environment is giving HackensackUMC a rapid return on investment (ROI). "We are seeing huge, significant savings on hardware and support costs that pay off the investment very quickly," says Lamdagan. His data

shows that the platform TCO for Caché in HackensackUMC's virtualized environment with Intel technologies is almost half that of HackensackUMC's previous RISC environment. Operating costs, including support for the hardware, software, and operating system, are 40 to 50 percent lower than on the previous platforms.

"In addition to the cost savings, we get all the invisible benefits, like faster turnaround and greater productivity," Lamdagan adds. "We save on people skills. We can focus our people to be experts in one environment and go with it. There's a whole chain effect that ends up with HackensackUMC being more competitive and delivering better care."

Storage Performance for Explosive Data Growth

HackensackUMC extends its IT standardization strategy to storage and security, choosing Intel-based solutions in both areas.

For storage, HackensackUMC uses EMC Symmetrix VMAX 40K systems based on the Intel Xeon processor E5 family. "With healthcare reform and increased retention requirements, we are seeing very rapid data growth, and it's not regular, incremental growth," says Lamdagan. "As the cost of genome sequencing drops, the growth will be absolutely explosive."

HackensackUMC uses the Intel processors for data deduplication, replication, cloning, and snapshots. "You need a powerful processor to do storage optimization techniques effectively," says Lamdagan. "The Intel Xeon processor E5 family gives us consistent high performance and reliability."

In addition to great performance, storage systems based on Intel technologies give Lamdagan and his team peace of mind. "When we pick a storage device, it has to have Intel technologies—not only because we're comfortable with Intel, but because it gives us extra confidence that it will be

compatible," he says. "When you bring in a new technology and write APIs, you want to be sure it's compatible and won't create any craziness."

EMC likewise earns Lamdagan's confidence. "EMC is the top player in the storage market segment," he says. "You can't go wrong with them in terms of performance, reliability, support, and road map. They have solid collaboration with Intel, and they're continuing to evolve with their technology. If I have an advanced requirement, they're more likely to be ahead of me rather than telling me they're working on it."

Protecting the Healthcare Enterprise

HackensackUMC uses enterprise solutions from McAfee and Intel to manage risk and help maintain the confidentiality of protected health information. "Standardization means that we want to use one company's security suite," Lamdagan says. "We are standardizing our processes and deployment and delivery models along with the platform. This gives us clear visibility end-to-end and a long-term road map. We started with McAfee Data Loss Prevention* and now use most of the McAfee suite as our enterprise solution."

Lamdagan sees significant value in the tight integration between McAfee security software and innovations such as Intel® Trusted Execution Technology (Intel® TXT), which extends security below the operating system. "Our goal is to put the protection at the lowest level," Lamdagan says.

To speed data encryption, Lamdagan looks forward to using Intel® Advanced Encryption Standard New Instructions (Intel® AES-NI) as a native function with Caché as soon as Epic certifies it. Activating transparent data encryption (TDE) can increase CPU overhead by 800 percent from baseline performance with no encryption. Intel and Epic performed lab tests using the Oracle Database* for

Lessons Learned

Prepare for the future by standardizing your data center and cloud environment on reliable, high-performing, cost-effective technologies—but choose carefully. "Standardizing gives you all these advantages, but the trade-off is that you're putting all your eggs in one basket," says Prisco Lamdagan, Jr. "So you need to carefully do your due diligence. The key is to pick vendors who are invested in your success and work closely with them. The best vendors don't just view you as a client but as a true collaborator."

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online analytical processing. Their tests showed that performing encryption with Intel Xeon processors and Intel AES-NI reduces the impact on CPU performance by 50 percent.²

"Intel has put a lot of investment in McAfee and in its own security technologies," says Lamdagan. "It has shown a real commitment to lead in this area and contribute to the sanity of the tech world by providing a more secure world. The traditional approach of protecting at the surface level will not survive. It's just not enough."

Succeeding for the Next Generation

Through its standardization strategy and its end-to-end use of Intel technologies, HackensackUMC IT has aligned its infrastructure and workforce with HackensackUMC's strategic and clinical goals. "Intel brings IT to the next level," Lamdagan says. "It enables us to provide an EHR system that is more scalable, resilient, secured, and available, which will help us provide a better patient care system. That's why we work so hard."

And, as Dr. Rab points out, the work is vitally important. "We have to succeed at this," he says. "If we as a generation cannot figure out healthcare and bring the cost down, our children will not forgive us."

Find the solution that's right for your organization. Contact your Intel representative, visit Intel's **Business Success Stories for IT Managers**, or explore the **Intel.com IT Center**.



¹ HackensackUMC Ratings, Rankings and Recognition. Accessed September 17, 2013, <http://www.hackensackumc.org/USN/>.

² Encrypt Healthcare Data with Performance Using Intel® Xeon® Processors, accessed September 16, 2013. <http://www.intel.com/content/www/us/en/healthcare-it/encrypt-healthcare-data-with-performance-using-intel-xeon-processors.html>
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Intel® AES-NI requires a computer system with an AES-NI-enabled processor, as well as non-Intel software to execute the instructions in the correct sequence. AES-NI is available on Intel® processors. For availability, consult your reseller or system manufacturer. For more information, see <http://software.intel.com/en-us/articles/intel-advanced-encryption-standard-instructions-aes-ni/>.

No computer system can provide absolute security under all conditions. Intel® Trusted Execution Technology (Intel® TXT) requires a computer with Intel® Virtualization Technology, an Intel TXT-enabled processor, chipset, BIOS, Authenticated Code Modules, and an Intel TXT-compatible measured launched environment (MLE). Intel TXT also requires the system to contain a TPM v1.s. For more information, visit www.intel.com/technology/security.

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