How to Turn on Greater Productivity by Deploying Windows* Running on Intel® Architecture

Carestream Works with Intel to Deliver Windows-Based Solutions That Deliver Faster Performance and Higher Availability at a Lower Cost

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Evolving Data and IT Needs, by Chris Gough

Chris Gough, Intel's Lead Solutions Architect for Health & Life Sciences

The computing environment within data centers is evolving as organizations in healthcare and other industries migrate to an interoperable infrastructure. Today data is often trapped in proprietary RISC and mainframe systems. Many facilities are currently using a dedicated infrastructure for mission-critical applications and a virtualized x86-based infrastructure for enterprise-wide solutions. In the future, many institutions are evaluating the move to a robust cloud infrastructure for all workloads.

The data center is evolving in response to escalating growth in the number of users and the variety of devices, which now includes tablets and smart phones in addition to workstations and laptops. An even more pressing issue is the explosive growth in data. New generations of three-dimensional imaging devices such as MR, CT and other technologies are producing image files that are exponentially larger than they were just a few years ago.

Other challenges facing healthcare institutions include developing and instituting measures designed to prevent a breach in the security of patient data that could result in unauthorized access—as well as the resulting publicity and negative consequences.

To deal with a future that is likely to continue to produce increases in data, managers are focusing on updating their systems to achieve the greatest possible computing capacity per square foot.

Most healthcare facilities are monitoring IT spending very closely and most IT resources are being spent to maintain existing operations. Unfortunately this leaves less money for enhancement and innovation.

Balanced Data Center Solutions

Most people think of Intel as a chip company. And while that is a large part of Intel's legacy and future, Intel is also investing in developing network and storage technologies since computing, networks and storage are the three legs of a stool for on-site or cloud-based data centers.

Each of these areas needs to offer optimized performance to ensure a satisfactory experience for end users. High-performance 10 gigabit Ethernet networks are preferred, and storage may include spinning disk but will also include a high-performance storage tier based on solid state disks. There have been major advances in storage technology over the last five to six years with most of the leading storage vendors and solutions moving to platforms based on Intel® Xeon® processors for computing.

The move to nonproprietary x86-based servers is dramatic. An IDC Server Forecast shows that in 1996 just 56% of servers worldwide used x86 servers. The study expects x86-based servers (platform based on the Intel Xeon processor) to make up 98% of the market by 2016. The study predicts that

proprietary RISC-based servers will fall from 44% of the market in 1996 to just 2% in 2016.

IDC studies also report that use of *SPARC Solaris is steadily declining and that 80-90% of data centers are actively or highly likely to migrate to Windows- or Linux-based solutions. Windows is expected to gain the highest market share, with Linux in second place and just a small minority expected to stay with UNIX.

Key Reasons for Migrating

Competitive pricing leads to reduced support and maintenance costs when migrating to a Windows operating system and x86-based servers. Healthcare facilities and other users also gain access to a large number of administrators who are trained to manage these systems. And there is no longer a need to have a separate manager for propriety RISC systems if you have consolidated on a standard server platform.

Increased performance is another advantage — since a Windows OS with virtualized x86-based servers can achieve exceptional computing capacity per square foot. This simultaneously allows the data center to maintain its existing footprint and can help reduce existing power and cooling needs.

Carestream's Migration, by Tony Tongourian

Tony Tongourian, Carestream's Worldwide Director of Platform and Architecture

Because of all the performance and cost advantages Chris has outlined, Carestream migrated its healthcare IT solutions to a Windows environment running on Intel Xeon processor-based servers. We are embracing an industry-standard open platform architecture that supports a wide choice of suppliers.

The Windows environment running on Intel architecture-based servers offers a 65% savings in hardware compared to a Sun/Oracle environment, which is an attractive benefit. These servers are also easier to maintain and well-trained IT talent is readily available to support this environment in healthcare facilities worldwide. Vue PACS features currently in development will take advantage of Intel Xeon processors.

Our new architecture will also deliver improvements in key areas including performance, security, availability and virtualization:

Performance: Intel worked closely with Carestream to further optimize the performance of our imaging processing software algorithms on server platforms based on Intel Xeon processors. The result is even faster response times, greater capacity and lower costs than we would be able to achieve with the migration alone. With each new release of Intel Xeon processors we expect to deliver even higher computing density for each data center. Deploying blade servers also drives up computing power without increasing space requirements.

Security: Traditionally, security has been enabled through the use of specialized software on general hardware. Now, with Intel® Advanced Encryption Standard – New Instructions (Intel® AES-NI), we can offer our customers hardware-accelerated encryption that delivers both higher performance and an exceptional level of security. This is true for both on-site and cloud services. Core elements of encryption are now supported in the processor with specific instructions.

Availability: Different high availability configurations can be deployed on servers running Windows including VMware vSphere* to offer industry-leading availability that is required by healthcare facilities.

Virtualization: Carestream customers also gain benefits of virtualization with VMware's vSphere such as server consolidation, business agility and availability.

The new architecture will further enhance our portfolio of healthcare IT solutions by allowing us to deliver Vue PACS, our Vue Motion image viewer used by clinicians and referring physicians, and our Clinical Data Archive from the same server. Vue Motion is Windows/Intel based and can deliver fast real-time imaging access to on-site or off-site physicians and clinicians. The MyVue patient portal resides on a separate server for security because it is accessed by patients through the Internet.

We believe our customers and their patients will both benefit from the increased performance delivered by our newest generation of healthcare IT systems.

Software and workloads used in performance tests may have been optimized for performance only on Intel microprocessors. Performance tests, such as SYSmark and MobileMark, are measured using specific computer systems, components, software, operations and functions. Any change to any of those factors may cause the results to vary. You should consult other information and performance tests to assist you in fully evaluating your contemplated purchases, including the performance of that product when combined with other products. For more information go to http://www.intel.com/performance.

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 select 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.

*Other names and brands may be claimed as the property of others.

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