SOLUTION PROFILE
Intel® Xeon® Processor E7 Family
Carestream Health

Increasing the Scalability of Medical Imaging Solutions

Carestream Health's picture archiving and communication system (PACS) solution supports large numbers of concurrent users per server with the Intel® Xeon® processor E7 family.

For companies that make products to support the delivery of health-care services, helping customers minimize TCO is a strategic imperative. One way that Carestream Health addresses that need is by validating its SuperPACS* solution on the latest Intel® Xeon® processors, demonstrating the ability of the new platform to support more users per server. Using the Intel® Xeon® processor E7 family, Carestream showed a 1.28x performance increase over predecessor platforms.[1]

Solution provided by:

Carestream HEALTH

CHALLENGE:

Enable medical imaging customers to reduce the capital and operational expenses associated with their picture archiving and communication system (PACS) solutions, providing greater operational efficiency for the customers and a competitive advantage for the solution provider.

SOLUTION:

Without any platform-specific software optimization, Carestream SuperPACS takes excellent advantage of the scalable performance features and capabilities of servers based on the Intel Xeon processor E7 family, including increased core count and larger last-level cache. Validating SuperPACS on the new platform and quantifying the performance benefit lets customers benefit from the most up-to-date servers the industry has to offer.

CUSTOMER BENEFIT:

The increased performance on the Intel Xeon processor E7 family relative to the Intel® Xeon® processor 7500 series equates to a higher number of users per server at customer locations. That increase lets customers reduce the number of servers they need, for a healthier bottom line.

Making a Great Thing Better: Running on the Intel® Xeon® Processor E7 Family

The PACS systems used in medical imaging facilities are designed to economically provide rapid storage and retrieval of images and reports from multiple sites and using multiple modalities (such as MRI and CT imaging). Medical necessity requires that the PACS server infrastructure be able to provide high standards of service to large numbers of simultaneous operators. The Intel Xeon processor E7 family is well suited to those demands for highly scalable performance.

To quantify the advantages available from the new platform, Intel assisted Carestream in testing that simulates a large number of users performing routine radiological tasks. In order to quantify the user experience, they compared the number of frames per second the server can accommodate and found an increase of 1.28x using the Intel Xeon processor E7 family compared to the Intel Xeon processor 7500 series.[1]

Carestream engineers have taken a multifaceted approach to ensuring that SuperPACS delivers excellent performance and readily takes advantage of the new platform's capabilities:

- **Multi-threading**. Carestream has built a proprietary threading library that efficiently divides tasks among the growing number of available processor cores.
- **Intel® Software Development Products**. Intel® VTune™ Performance Analyzer helps locate hotspots and optimize the environment, while Intel® Thread Profiler helps balance workloads on highly parallel hardware.
- **Industry best practices**. The SuperPACS development team keeps abreast on documentation from Intel on topics such as performance optimization and taking advantage of new memory subsystem architectures.

Carestream's ongoing diligence in enabling SuperPACS for the latest Intel® architectures helps ensure that medical-imaging customers will continue to get optimal performance and value from their server investments.

Engines of Change: The Intel® Xeon® Processor E7 Family

The Intel Xeon processor E7 family extends the limits of scalable performance, reliability, security, and energy efficiency for enterprise servers:

- **Scalable Performance.** Up to 10 cores (20 threads), support for 32-GB DDR3 DIMMs (2 TB per four-socket system),[2] and 30 MB of last-level cache.
- **Reliability and Security.** Intel® Advanced Encryption Standard New Instructions (Intel® AES-NI), Intel® Trusted Execution Technology, Double Device Data Correction (DDDC), and Partial Memory Mirroring.
- **Energy Efficiency.** More performance within the same power envelope as predecessors, Intel® Intelligent Power Technology,[3] and low-voltage DIMM support.[4]

Learn more about Carestream Health: **www.carestream.com**

Learn more about the Intel® Xeon® processor E7 family: **www.intel.com/xeon**

[1] Performance testing by Intel and Carestream Health. Configurations:
- Intel® Xeon® processor E7 family at 2.4 GHz, 64-GB RAM, Microsoft Windows Server* 2008 R2, Carestream SuperPACS* 11.3, Intel® Hyper-Threading Technology disabled, Intel® Turbo Boost Technology enabled, NUMA disabled.
- Intel Xeon processor 7500 series at 2.06 GHz, 64-GB RAM, Microsoft Windows Server 2008 R2, Carestream SuperPACS 11.3, Intel Hyper-Threading Technology disabled, Intel Turbo Boost Technology enabled, NUMA disabled.

[2] Up to 64 slots per standard four-socket system x 32 GB/DIMM = 2 TB.

[3] Uses similar core and package C6 power states enabled on Intel® Xeon® processor 5500 and 5600 series. Requires OS support.

[4] Savings dependent on workload and configuration. Example: At 100-percent SPECpower* load it can save ~0.8W for 4-GB DIMM DRx8 based on early Intel internal estimates.