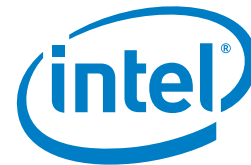


CASE STUDY

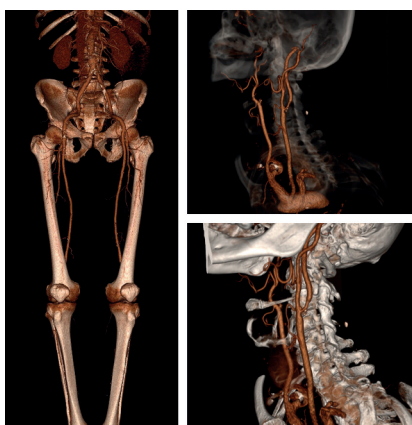
Intel® Xeon® Processor E5-2600 v2 Product Family

High-Performance Computing
Healthcare



Sectra enables more clinicians to access 3D visualization of radiology images

The Intel® Xeon® processor E5-2600 v2 product family enables 3D images to be streamed to less powerful devices, so more clinicians can use them



SECTRA

“The improved performance of the Intel® Xeon® processor E5 v2 product family will enable large hospitals to consolidate and use fewer servers to manage image visualization.”

Fredrik Gustavsson,
CTO,
Sectra

Until now, advanced visualization of radiology images has required the radiology workstations to be equipped with specialized graphics cards. Sectra found it could eliminate those graphics cards by using the Intel® Xeon® processor E5-2600 v2 product family to generate the images and stream them, not only to the radiology workstations, but also to a wider range of devices. Now valuable medical information can be distributed outside the radiology department and more widely across the hospital, helping increase the quality of care and potentially improve the patient experience.

Challenges

- **Powerful processing.** Enable computed tomography images of up to 2,000 MB to be viewed and navigated smoothly in 3D by radiologists and other medical professionals.
- **Restricted access.** Eliminate the need for highly specialized hardware to view the radiology images so they can be viewed using standard desktop hardware and mobile devices.

Solutions

- **Updated processor.** Sectra optimized its Sectra PACS* software for the Intel Xeon processor E5-2600 v2 product family.
- **Image streaming.** Sectra re-architected 3D imaging in Sectra PACS to create the images on the server and stream them to the client devices on demand.

Technology Results

- **Performance increase.** Sectra’s own tests showed that its new software version could support 35 percent more concurrent users using the Intel Xeon processor E5-2600 v2 compared with previous version processors.
- **Linear scaling.** The move from 8 cores to 12 increased performance by 50 percent according to Sectra’s own research that shows that its application scales perfectly with the number of cores.

Business Value

- **Hardware consolidation.** The increased performance enables hospitals to serve more users with the same hardware, potentially consolidating hardware to save money.
- **Increased market segment.** Sectra can now license its software to the wider hospital community, beyond those who have access to specialist workstations.

A snapshot of the human body

To make a swift and well-informed decision, doctors need easy access to information about their patients. That information can be highly visual and is often digital, as is the case with computed tomography (CT) scans. These enable doctors to look at the structures inside a patient’s body by navigating through pictures that show thin slices of the body. The pictures are created using X-rays and stored on a picture archiving and communication system (PACS).

The images for one patient could be up to 2,000 MB in size, performing 3D imaging requires workstations with powerful graphics cards. A large hospital might have a hundred workstations, but these are expen-

sive and often restricted to the radiology department. The desktop computers used more widely throughout the hospital are not powerful enough to work interactively with the CT images in 3D. That’s an even bigger problem with the tablet computers increasingly used to enable more informed decision making on the wards and at the bedside.

Sectra is one of the world’s largest independent providers of PACS. Its Sectra PACS software often runs on servers powered by the Intel Xeon processor E5 family. The software enables radiologists to look at thin slices (often several thousand for one patient), view thicker slices based on a combination of slices, or view the images in 3D as a color picture that shows the skeletal and vascular structure.



Hospitals consolidate servers thanks to the improved performance of the Intel® Xeon® processor E5-2600 v2 product family

Fredrik Häll is the product owner for visualization products in Sectra PACS. He says: "There were two problems with our dependence on the radiologists' workstations. The first was that the solution required very specific graphics cards. With today's rapid pace of innovation, it was hard to support all the graphic cards in the machines. The second problem was that the use of specially designed workstations stopped applications from being deployed beyond radiology departments. Our software often couldn't be used by surgeons, clinicians or orthopedics departments, where they had generic desktops and the clinical use of 3D has huge potential."

Increasing performance

For the new release in November 2013, Sectra optimized its software for version 2 of the Intel Xeon processor E5-2600 product family. Intel provided evaluation kits and helped to ensure Sectra achieved proper performance scaling. "The evaluation kits were very useful," says Häll. "They gave us a way early on to model the expected performance improvements over the previous generation, and gave us a way to communicate these to customers and our sales people. They were helpful both for quality assurance and as a way to assess things in advance."

Sectra's own tests demonstrated that its software could support 35 percent more concurrent users on the new server architecture compared to the

previous version. Sectra re-architected its solution so the image processing is carried out on the server, with images streamed to the radiologist's computer on demand. That means there's no need for an expensive graphics card in the workstation, and CT visualization in the PACS can, for the first time, be used on desktops and tablet devices.

"The images also look better now," says Häll. "It's like comparing SD to HD in television, and with the new Intel platform, the interaction is smoother too."

Savings in the hospital

For customers, there is a significant cost savings potential. "The improved performance of the Intel Xeon processor E5 v2 product family will enable large hospitals to consolidate and use fewer servers to manage their radiology images," says Gustavsson. "That lowers operating expenses. Alternatively, they can have more concurrent users on a server and those users will receive a more responsive and high quality experience too."

Häll adds: "The new 12-core processor also delivers a 50 percent performance increase, compared to the older eight-core processor, according to our own research. Our software scales linearly with the increasing number of cores, so we saw a 50 percent performance increase out of the box." For hospitals that use virtualization, the higher number of cores can enable them to save money on their VMware* licenses, because they can now run more virtual machines on the same physical machine.

Häll adds: "Large hospitals might have 200 workstations, so eliminating specialized graphics cards can deliver significant savings. Lowering the technical barriers makes it possible for 3D images in the PACS to be accessed more widely across the

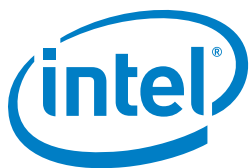
Lessons Learned

"Our upgrade shows the importance of having software that scales well with the increasing number of cores," says Häll. "We expect to see processors continue to increase the number of cores rather than increase the speed of each core. Having a strong performance improvement from new hardware, without having to change the software, is a significant benefit."

hospital by whomever has the most need, too. Radiologists are comfortable working with thin slices, but clinicians want to see 3D representations that look like a real person. Our system enables them to do both."

The new platform is also more energy efficient, offering significant performance improvements for the same power envelope, Häll says. Sectra's own research showed a 44 percent increase in maximum performance on the SPECint*_rate_base2006 benchmark for a 115W thermal design power (TDP) rated CPU. "This results in reduced costs for cooling and power, both contributing to overall better performance per OPEX dollar," says Häll.

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