

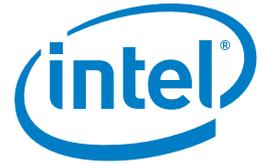
CASE STUDY

Intel® Xeon® processor 5600 series

Enterprise Server

Energy Efficiency, Environment, and Performance

Virtualization



A Sunny Outlook for Energy-Efficient Performance

Sunnybrook cuts costs and meets density and power requirements with Intel® Xeon® processors

As a Canadian leader that cares for 1 million patients annually, Sunnybrook Health Sciences Centre faced rising demand for services—but its main data center was reaching capacity. By virtualizing on Intel® Xeon® processors and upgrading the data center's cooling technology, Sunnybrook doubled the number of racks its data center can support and significantly reduced energy consumption. Sunnybrook saves tens of thousands of dollars each year on electricity costs and earned a one-time Data Centre Incentive Program (DCIP) incentive award of CAD 33,360 from its utility provider, Toronto Hydro Electric System Ltd.



CHALLENGES

- **Rising demand.** One of Canada's most prestigious healthcare institutions, Sunnybrook develops and deploys a wide range of new healthcare applications.
- **Aging data center.** Sunnybrook's lead data center was 20 years old, bursting at the seams, and unable to support the institution's growing IT requirements.
- **Constrained budgets.** Canadian healthcare budgets are "very, very tight," according to Oliver Tsai, Sunnybrook IT director. He needed cost-effective solutions that could reduce operating costs.

SOLUTIONS

- **Energy-efficient Intel Xeon processors.** Sunnybrook virtualized on Dell PowerEdge* R710 servers powered by the Intel® Xeon® processor X5570 with 32 GB of RAM and VMware vSphere* 4. Now it is moving up to the six-core Intel® Xeon® processor X5670 and 96 GB of RAM.
- **Power and cooling upgrade.** Sunnybrook added another uninterruptible power supply (UPS), replaced its heating, ventilation, and air conditioning (HVAC) unit with American Power Conversion (APC) InRow Cooling* technology, and reorganized its equipment.

IMPACT

- **Increased capacity and performance.** Sunnybrook achieves 30:1 virtual machine (VM) density across a range of applications and can fit twice as many racks in the data center.
- **Better care.** Sunnybrook can deploy innovative applications that maximize its investment in electronic health records and improve the way it handles vital tasks such as managing patient records, coordinating referrals to specialists, and reducing infections.
- **Lower energy consumption and cost.** The project reduced total energy demand by 41.7 kW and annual electricity consumption by 267,158 kWh, saving approximately CAD 26,716 on Sunnybrook's yearly electricity bill.
- **Energy incentive award.** Toronto Hydro issued Sunnybrook a one-time DCIP incentive award of CAD 33,360.

The Intel® Xeon® processor helps Sunnybrook save tens of thousands of dollars on electricity costs



“Our ability to consolidate more virtual guests on fewer physical hosts has increased, not only because of software advances but because of Intel’s advances in multicore performance. The net result is that we’re able to pack a tremendous amount of compute power into a very dense server rack setup in our renovated data center.”

– Oliver Tsai
Director of Information Technology
Sunnybrook Health Sciences Centre

Meeting an Insatiable Demand with Intel® Technologies and Virtualization

Based in Toronto, Ontario, Sunnybrook earned honors as one of Canada’s greenest hospitals and most environmentally friendly companies. But green concerns aren’t what led Oliver Tsai to overhaul his flagship data center and expand Sunnybrook’s use of virtualization with the latest Intel Xeon processors. He needed the performance, density, and energy efficiency to run the fast-growing set of applications that support Sunnybrook’s clinicians, researchers, and students, and deliver software as a service (SaaS) applications to community hospitals across the province.

“The business demand for IT in healthcare is insatiable,” Tsai says. “Users are no longer resisting technology—they’re demanding technology. We find ourselves developing and delivering more and more software, and we need the infrastructure to support that. Greening the data center is great, but what drives our business in the data center is compute: being able to deliver computing capacity in a very small physical footprint.”

Tsai gets the performance and density his institution needs from virtualizing with VMware software on the latest Intel Xeon processors. “Intel’s processing power has gotten better and better and better,” he says. “Our ability to consolidate more VMs on fewer physical hosts has increased, not only because of software advances, but also because of Intel’s advances in multicore performance. The net result is that we’re able to pack a tremendous amount of compute into a very dense server rack setup in our renovated data center.”

Intel and VMware Help Sunnybrook Create a Nimble Data Center

Sunnybrook consolidates 30 VMs onto a single Intel® Xeon® processor 5500 series-based server, and Tsai says the figure will go much higher with the Intel Xeon processor 5600 series. The newer processor offers higher performance and memory bandwidth, and the configuration Sunnybrook is deploying provides 50 percent more cores and three times the memory of Sunnybrook’s Intel Xeon processor 5500 series-based platforms.

Besides adding servers based on the Intel Xeon processor 5600 series, Sunnybrook is upgrading to VMware vSphere 4.1. Tsai says Sunnybrook benefits from the work Intel and VMware do to create synergies between hardware and software. The newest VMware software uses the Intel® Advanced Encryption Standard New Instructions (Intel® AES-NI) to improve data security by accelerating encryption and decryption performance. VMware VMotion* works with Intel® Virtualization Technology (Intel® VT) FlexMigration to move VMs between different generations of Intel Xeon processors.

“We heavily use VMotion and, as much as it sounds like a cliché, it really does make us nimble,” says Tsai. “A hospital is no different from any other business. The business is always redefining priorities and coming up with new goals and objectives. IT infrastructure needs to be flexible and responsive to those changes. Today, we can adapt very quickly to achieve better resource allocation. Only a few years ago it would have been like lifting mountains to be able to reallocate and redistribute resources so that your environment is as optimized as possible.”

Energy Incentive Award Adds to the Business Case

Given tight healthcare budgets, Tsai was happy to gain the computing capacity he needed while cutting costs and reducing energy consumption. He also earned Sunnybrook a financial incentive through Toronto Hydro's DCIP. Toronto Hydro is a pioneer in rewarding organizations for reducing their energy consumption in the data center. The DCIP incentive adds CAD 33,600 to the project's bottom-line benefits.

Data center incentive programs are a win for IT departments. "They can enable IT departments to implement changes that they might not be able to make without the funding from the incentive," says Michael Pardal, conservation and demand management program consultant with Toronto Hydro. "I'd encourage customers to engage with their utility early in their planning process to see if incentives are available and, if so, to work to meet the criteria and build the incentives into their business case."

Find a solution that is right for your organization. Contact your Intel representative or visit the Reference Room at www.intel.com/references.

SPOTLIGHT ON SUNNYBROOK

Located in Toronto, Ontario, Sunnybrook Health Sciences Centre is one of Canada's largest hospitals and a center of excellence in patient care, medical education, and research. It has over 10,000 physicians, staff, and volunteers who care for 1 million patients annually. Over 600 Sunnybrook scientists conduct CAD 100 million in scientific research each year.



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