CASE STUDY

Intel® Xeon® processor 5600 series

Enterprise Server
Automation and Cost Savings in the Cloud

Cloud transformation at top Hungarian University

Intel® Xeon® processor 5600 series allows ELTE University to establish and optimize cloud services

The ELTE Department of Information Technology Services operates as the centralized IT organization of Eötvös Loránd Tudományegyetem (ELTE University). Its main task is to serve the general, financial, management and scientific IT needs of the university's faculty. It operates the IT infrastructure, coordinates the development of applications, and is responsible for operating thousands of personal computers and hundreds of servers according to service-level agreements (SLAs).

CHALLENGES

- **Research collaboration.** Universities across the world are increasingly working together on research projects, so ELTE University needed to ensure its IT infrastructure allowed for this international collaboration
- **Fragmented IT.** Every faculty established and maintained its own IT infrastructure, creating a heterogeneous environment that was both complex and expensive to support
- **Resources optimization.** Similar to other state-owned institutions, ELTE University is under continuous pressure to cut expenses and to optimize the use of resources

SOLUTIONS

- **Intel® Cloud Builder Program.** The ELTE Department of Information Technology Services studied the Intel Cloud Builder Program Solutions Library for best practice in establishing cloud-based services
- **Intel® Xeon® processor.** The Intel Xeon processor 5600 series provides hardware support for virtualization and central management capabilities for cloud-based services
- **Hardware-supported virtualization.** With the help of virtualization, the ELTE Department of Information Technology Services can deploy secure machines quickly and easily

IMPACT

- **Cloud infrastructure.** Helped to accelerate the integration of disparate IT systems across the university, eliminating the need for standalone servers and significantly reducing the number of physical machines
- **Simplified management.** IT and storage virtualization simplify data center management and enable quick and safe system testing and upgrades
- **Higher availability.** ELTE University was able to establish 99.99 percent availability for IT management systems and student IT services

"With the Intel® Xeon® processor 5600 series and the help of Intel® Cloud Builder Program reference architectures, we were able to create a completely new IT infrastructure for both general IT services and HPC needs, in one step."

Dávid Ritter,
CIO, Department of Information Technology Services, ELTE University

Challenges of a modern university in the EU

Universities across the world are increasingly working together on research projects. As a result, ELTE University needed to ensure its IT infrastructure allowed for this international collaboration, as well as supporting the normal daily activities of its own professors and students.

The university needed to offer visiting teachers and students access to its IT systems and also provide its own teachers and students with access to the IT systems of other universities, both inside and outside of Hungary. Additionally, this access needs to be able to work over various networking technologies including Ethernet and Wi-Fi, and be compatible with the authentication systems of other universities that are completely different from its own.

Every department in the university established and maintained its own IT infrastructure, creating a heterogeneous environment that was both complex and expensive to support. At the same time, an increasing number of faculties required SLAs for IT management and student registration systems, making IT support even more complex. The research institutes also required greater IT performance than ever before, within a very limited budget. And to top it all, there was time pressure on the university to address these challenges to comply with regulations determining EU-supported projects.

The ELTE Department of Information Technology Services had to find a way to replace its existing enterprise resource planning (ERP) system, its student management system and its high-performance computing (HPC) cluster simultaneously and within a very strict budget.

High-performance Intel hardware provides long-lasting value

Spotlight on ELTE

ELTE University is a leading higher education institute in Hungary. It was named after physicist Loránd Eötvös, who was a great inventor and whose laws are still in use in physics today.

Teachers, students, and staff are located in two main campuses and in five primary and secondary training schools. ELTE University has about 5,000 employees and 30,000 students in eight faculties.

The ELTE Department of Information Technology Services operates with 50 people and is responsible for everything from the landline telephone system to the SAP* Enterprise Resource Planning solution, the research network and the HPC infrastructure. It sees itself as an SLA-based service provider.

Benefits of the Intel Cloud Builder Program

The management and cost benefits of virtualization have been widely accepted for quite some time. However, to date, the ELTE Department of Information Technology Services had tended to approach IT from an evolutionary rather than a revolutionary perspective.

It knew that a virtualized infrastructure would let it simplify the management of its IT systems, get rid of its fragmented IT islands and reduce costs and had already spent three years preparing for this consolidation. This groundwork included compiling a full service inventory; devising policies and methodologies; standardizing user support; making organizational changes; and conducting technical tests, training, pilots, and planning.

However, to map out a complete overhaul of its IT infrastructure, the ELTE Department of Information Technology Services required outside assistance. Eager to reap the benefits of a full cloud-based infrastructure, it looked to the Intel Cloud Builder Program Solutions Library for guidance in best practices.

The Library publishes tried-and-tested reference architectures from a range of different IT suppliers, and any organization looking for proven cloud solutions can refer to it. The ELTE Department of Information Technology Services found that consulting the library accelerated its IT transformation, since it was able to pick proven solutions and avoid mistakes that would have delayed the roll-out of its new IT infrastructure. The use of an open, standards-based, documented, and modular approach helped ELTE University to quickly define the basic principles of the cloud it planned to build:

- Homogenous infrastructure
- One system versus multiple systems
- A service-oriented rather than a hardware-focused approach
- Everything must be in the cloud to provide truly flexible IT support

The ELTE Department of Information Technology Services won managerial support for its project in December 2009. A new HPC system went live just over a year later in February 2010, and its cloud platform went live one year after that in February 2011.

The new HPC server farm runs on Intel Xeon processors E5520, offering 99.99 percent availability, 600GB of RAM and 3.3 tflops of performance. Based on HP hardware, it already supports more than 50 different research projects.

ELTE University uses Intel Xeon processors X5650 in the cloud, again offering 99.99 percent availability to 150 virtual machines (VMs) supporting 20,000 active users. The virtualization infrastructure is based on VMware* software, with hardware from NetApp and Fujitsu.

Together with the chipset and the networking cards, these Intel technologies provide the necessary platform to support ELTE University's diverse IT needs for a lower total cost of ownership (TCO), clearly illustrating the power of the Intel platform.

Dávid Ritter, CIO, Department of Information Technology Services at ELTE University said: "We had to come up with solutions in a very short time frame for two very different areas. We saved a lot of time by studying the Intel Cloud Builder Reference Library. It was a great success for the university. We proved that new ideas can be implemented quickly, learning from the proven resources and planning well ahead."

Return on investment

Almost everything is now in the cloud, including email, Web and storage services, and the education support, institute management, and document management systems. The only exception is the HPC server farm.

Thanks to the cloud, ELTE University now operates a homogenous IT infrastructure. It has also been able to integrate the disparate IT systems across the university, eliminating the need for standalone servers and significantly reducing the number of physical machines.

IT management is simpler and much more cost-effective. The need for complex and slow backup systems has been eliminated and it is now easy to provide the IT resources to support new projects while helps to improve IT flexibility. The new infrastructure also supports remote working, thus providing a base for savings on travel and other associated costs. ELTE University is also able to provide proven HPC solutions to other institutes.

Finally, ELTE University now has a disaster-tolerant solution with load balancing in its two main campuses. The resulting 99.99 percent availability provides the foundation for quality SLAs with faculties and departments.

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

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