Driving Innovation in Academia with xFusion: Istanbul Technical University's Strategic HPC Upgrade

A Legacy of Innovation Meets the Demands of the Future

Istanbul Technical University (ITU), the world's third-oldest technical university and Turkey's leading institution for engineering and technical education, has a rich history dating back to 1773. With over 25,000 students, ITU consistently produces top-tier professionals and drives groundbreaking research. However, rapid student enrollment growth, evolving teaching technologies, and increasing research demands necessitated a next-generation computing infrastructure to support the university's ambitious vision.

Confronting the Challenges of Modern, Data-Driven Academia

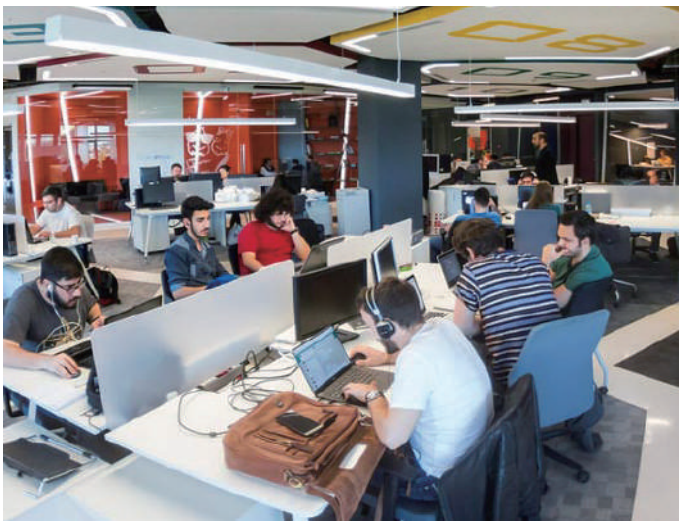
Modern research, spanning diverse fields from engineering and physics to social sciences, relies heavily on complex, large-scale computations. The exponential growth of research data can overwhelm traditional systems, creating processing bottlenecks and hindering innovation. ITU's curriculum, which emphasizes hands-on projects requiring real-time data analysis and interactive simulations, further strained its existing infrastructure.

University leaders envisioned upgrading ITU's computing backbone to match its pioneering spirit. Their objectives focused on delivering not only raw computational power but also reliability, energy efficiency, and robust security. With a clear mission to sustain ITU's global leadership in academia, the university turned to xFusion.

xFusion: A Tailored HPC Solution for ITU's Unique Needs

xFusion conducted an in-depth analysis of ITU's computing resource usage patterns, focusing on data throughput, computational intensity, and storage needs. This real-world usage mapping allowed xFusion to engineer a solution with ample capacity for demanding workloads and adaptability for future growth.

The core of the solution is the FusionServer 2288H V7, a 2U 2-socket rack server designed for extreme performance, large memory capacity, and flexible expansion. Equipped with the latest Intel® Xeon® Scalable processors (supporting up to 350W



The solution also provides robust cooling and operational reliability through hot-swappable counter-rotating fans and an N+1 redundancy design. Diverse hard drive configurations and RAID options secure and accelerate data access, while flexible GPU deployment supports specialized computational needs. These features optimize academic performance, minimize downtime, and maintain a user-friendly environment.

Transformative Results: Accelerating Research and Enriching Education

After deploying xFusion's HPC solution, ITU saw significant improvements in system throughput and responsiveness. This accelerated research cycles and enabled more ambitious projects across various disciplines. Researchers experienced reduced wait times for HPC resources and faster processing of vast datasets, fostering collaboration with academic peers and industry sponsors.

In teaching, students gained real-time access to advanced simulations and data analysis tools, bridging theory with practice. This enriched learning environment prepares students for careers in AI, data science, and computational engineering. Professors can now incorporate more complex practical exercises, enhancing ITU's appeal to prospective students.

Furthermore, xFusion's advanced power management and cooling algorithms significantly reduced energy consumption, aligning with ITU's sustainability goals. This highlights the importance of green and energy-efficient solutions in academia. Simplified system management, supported by AI-driven monitoring and optimization, allows ITU's IT department to handle growing demands efficiently.

A Partnership for Continued Growth and Exploration

"FusionServer 2288H V7 has advanced performance, flexible configuration, stable operation, and excellent service quality. We look forward to continuing our close collaboration with xFusion to explore new possibilities in the field of education and research," said Samet Göberk Kılıç, Head of Network & System Service at ITU.

His words underscore the success of the collaboration, a testament to xFusion's commitment to its mission: "Let Computing Serve You Better." By providing modular, future-proof architecture and unwavering support, xFusion is actively driving the adoption of high-performance computing in educational institutions worldwide, empowering universities like ITU to reach new heights of academic achievement.

Summary of Key Points

Client: Istanbul Technical University (ITU)

Industry: Higher Education & Research

Region: Turkey

Challenges:

ITU faced the growing pains of a modern, data-driven academic environment. Exponential growth in data-intensive research, frequent bottlenecks due to HPC resource queues, and the need for secure, energy-efficient solutions to support thousands of users strained their existing infrastructure.

Outcomes:

- Faster research cycles and expanded project scope.
- Improved access to advanced tools for students and faculty
- Streamlined management and lower energy consumption
- Enhanced environmental compliance and resource efficiency

xFusion Solution:

- FusionServer 2288H V7 HPC server platform
- Up to 350W TDP per CPU
- Up to 32 DDR5 DIMMs and CXL-based memory expansion
- Intelligent O&M, hot-swappable cooling features, and AI-driven power management

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