

University of Pisa Employs Vertiv High Density Solutions for Its Hybrid Green Data Center Expansion



A Vertiv Case Study



Background

With international prestige, the University of Pisa is a public institution with 20 departments and high-level research centers in various sectors, including agriculture, astrophysics, computer science, engineering, medicine, and veterinary medicine. Established in 1343, the university has strong connections with renown institutes, cultural institutions, and industries, particularly in the field of information technology.

In 2016, the University of Pisa embarked on a project to develop a new data center building called The Green Datacenter. Vertiv was chosen to supply the critical infrastructure, and the successful project implementation led to a solid technical and strategic relationship with the university.

Challenge

More recently, the university turned to Vertiv to expand its data center and support high-performance (HPC) computing applications.

Known as “The Hybrid Green Data Center Expansion,” the project aims to scale the existing data center infrastructure and deploy HPC applications by utilizing the available wing of the building.

The challenge was to maintain the original design and user interface while incorporating new technological elements that meet the evolving HPC needs and support high operational flexibility.

These goals were achieved by adopting Vertiv™ Liebert® XDU liquid cooling systems and creating tailor-made hybrid aisles, which feature both air-cooling units and liquid cooling equipment.

In addition, space constraints led to the bespoke design of an external Vertiv™ Power Module. The hydraulic infrastructure has been expanded, allowing the previously delivered chiller units to supply chilled water to the new data center infrastructure.



UNIVERSITÀ DI PISA

Company Profile:

The University of Pisa is a public institution founded in 1343. It consists of 20 departments and counts more than 50,000 students.

Industry:

Education

Region:

Pisa, Italy

Project Milestones:

- February 2016 – Project kick-off for “The Green Datacenter”
- September 2017 - Completion of “The Green Datacenter”
- May 2023 – Project kick-off for “The Hybrid Green Data Center Expansion”
- March 2024 – Integration, testing and startup of Vertiv solutions

Solution

Vertiv supplied a variety of power equipment, air conditioning solutions for servers, storage, network components, and services, including four Vertiv™ DCC containment solutions for corridor closures. In terms of cooling, the hybrid solution includes 20 Vertiv™ Liebert® CRV units and two Vertiv™ Liebert® PDX-PI direct expansion floor-mount cooling systems with variable speed compressors, as well as three Liebert® XDU liquid cooling units, which control the temperature and flow of the refrigerant to the servers in a direct-to-chip application.

Vertiv also supplied various power supply and storage units, including two Vertiv™ Liebert® APM 500 kVA uninterruptible power supply systems and valve-regulated lead-acid batteries, eight Vertiv™ Liebert® RXA switchgear units, a 400 kW Power Module prefab solution, 76 Vertiv™ Geist™ switched power distribution units (PDUs) and 38 Vertiv™ VR racks. The interior space was completed with fire detection and extinguishing systems and a 630 kW generator set integrated with the Power Module.

Additionally, Vertiv provided consulting, design, installation, and commissioning services, including the integration of Vertiv™ Environet™ Alert software, which allows the customer to remotely monitor the entire infrastructure.

Results

Improved energy efficiency has been achieved through the implementation of strategies such as closing cold aisles and adopting hybrid cooling, a cutting-edge thermal management technology that optimizes external environmental conditions to lower energy consumption and system maintenance costs.

These solutions have facilitated the expansion of the data center despite constraints hindering growth within the existing building structure.

The main objective of our project was to incorporate new technologies to meet the evolving requirements of high-performance computing, while maintaining optimal operational flexibility. The requirements were perfectly met by Vertiv, which also enabled us to keep the increase in energy costs under control and ensure efficient management of our new data center.

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