



## THE UNIVERSITY OF PISA FOCUSES ON VIRTUALIZATION FOR SUSTAINABLE GROWTH OF THE DATA CENTER



### UNIVERSITÀ DI PISA

**CUSTOMER**  
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**WEB SITE**  
[www.unipi.it](http://www.unipi.it)

**INDUSTRY**  
EDUCATION

**LOCATION**  
PISA, ITALY

#### CHALLENGES

- Consolidate and secure several departmental data centers
- Increase system security, reliability and availability
- Increase performance and optimize IT infrastructure management
- Make the university's educational offering more competitive

#### THE SOLUTION

Development of a software-defined data center. With VMware, the University built a multi-site cluster and a virtualization infrastructure based on VMware vSAN.

Academy of ancient tradition, the University of Pisa evolves its ICT infrastructure in the sign of the software-defined data center. The new infrastructure, also based on VMware virtualization technologies, includes three main production sites, with a fourth dedicated to research and development systems, in a configuration of high reliability and security. With this new architecture, the University increases the reliability and security of the systems, in addition to the computing power and the availability of storage. The result is a better service for users and more flexible and easy-to-manage systems for the IT staff.

#### The University of Pisa

The University of Pisa is one of the oldest and most prestigious in Europe. It was founded in 1343, when Pope Clement VI issued the papal bull "In supremae dignitatis" with which he granted the recognition of the General Studio.

The flowering of the Pisan studio came first under the Medici with Lorenzo il Magnifico at the end of the fifteenth century and then with Duke Cosimo I, about a century later. In these years, Galileo Galilei was at first a student and then a professor of Mathematics of the University for about three years from 1589. Over the centuries the University has always been able to renew itself, and even today lives a phase of profound change, with the adoption of a new Statute, and with a structure that saw the birth of twenty new departmental structures. The University of Pisa maintains close relationships - in terms of teachers and services in common - with the other two university institutions of the city: the Scuola Normale Superiore of Pisa and the Scuola Superiore Sant'Anna.

#### Challenge

Under the guidance of Professor Antonio Cisternino - Delegate of the Dean for information technology - information systems are at the center of the transformation of the university, with a rethinking of infrastructures at the service of research and administrative systems for about three thousand users, including teachers and staff, and for over fifty thousand students.

Since the late nineties, the University facilities are connected by a proprietary fiber-optic network. Over the years, a series of smaller data centers have been built on this network infrastructure, resulting in a certain fragmentation of the University's information assets. Furthermore, 90% of the University of Pisa's IT systems were based on open source software.

The risk for the management of the information assets of the University was to become too complex and burdensome, especially considering the difficulty of

## BUSINESS BENEFITS

- The University has increased the reliability and availability of systems, in addition to computing power and storage availability
- Rationalization and consolidation of the infrastructure offers greater operational flexibility and a reduction in management costs
- The new architecture offers more performing, reliable and safe services to users, whether they are teachers, students or administrative staff, and easier maintenance for the technical staff

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MAURIZIO DAVINI  
CTO UNIVERSITY OF PISA

governing the maintenance of open source systems. Maurizio Davini is Chief Technology Officer at the University of Pisa since 1998, and his team is the operative arm for the design, execution and maintenance of IT networks and services.

"We had to consolidate and secure several data centers, distributed in the departments' offices: many were based on open source technologies", recalls Davini. The choice was therefore to create three parallel information and technology silos, in order to guarantee maximum flexibility. The systems dedicated to research and development are entrusted to open source technologies. For the most critical applications, the choice was to move towards enterprise-class architectures, which envisaged maintenance contracts, focusing on virtualization infrastructures based on VMware technology. Finally, the messaging and collaboration systems involve the use of Microsoft applications.

"The new design of IT at the university starts from a fundamental choice, for the modernization of data centers. It is a choice that has seen a fundamental piece in the virtualization of systems and that has been based, for all the most critical server and database systems, also on VMware technology", comments Davini.

## Solution

The Public Sector has the obligation to procure, with regard to IT infrastructures, through CONSIP government agency agreements. The dean's conference, which serves as a collector of the different departmental needs, has made available a convention to which the University adheres and which gives access to a large number of advanced technologies. In this context, the University has purchased a number of Dell servers in agreement, using them to build new infrastructures. The integration component was entrusted to the Partner VMware Assyris, who worked in collaboration with internal staff, completing the project in less than a month. "We have known the skills and professionalism of Assyris for many years and the relationship with them has been extraordinary", comments Davini.

The new data center has allowed to start a significant consolidation of the various data processing centers that the University had distributed in the various locations, moving to an infrastructure that will have at its disposal 4 well-identified data centers, three enterprise production and one dedicated to research and development activities. One of the nodes is a new data center, located outside the city, ten kilometers away, in a structure owned by the University. This infrastructure is at the basis of the restructuring of the information systems requested by Professor Cisternino and realized by the team of Maurizio Davini. From this infrastructural model, the system management team promotes the redesign of a series of services, both from an infrastructural point of view, with new virtualization architectures and new systems to support the calculation for research, and from the application point of view, with regards to the software that serves the administrative and technical processes of the university.

Virtualization is also a revolution for the technical staff, who has the opportunity to learn very innovative tools. "Our systems engineers are getting trained on new technologies: it is a step for them too and they are living it with enthusiasm, also because they are holding instruments that are much more performing and simple to manage", explains Davini.

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#### VMWARE TECHNOLOGIES

- VMware vSAN

#### HARDWARE PLATFORM

- Dell



#### PARTNER

- Assyris

## Benefits

“With VMware we built a twelve-server cluster, across multiple sites, and a vSAN-based storage virtualization infrastructure,” explains Davini. “We have focused on hyperconvergent systems, and this architecture allows us to significantly increase the reliability and availability of systems, both from the point of view of computing power and the availability of storage. Above all, we can make the best use of available resources, with maximum flexibility. All this means better services for users and a reduction in management costs for us”. In particular, there are three main categories of users involved: students, teachers and researchers, administrative staff. The applications and services to which these users access are performed today within a more reliable, secure and performing infrastructural environment, with the result of greater usability in the provision of services, in particular for the most critical administrative systems.

“There are three main features of the solution we have implemented with VMware technology”, continues Davini: “quality, reliability and flexibility”. The VMware vSAN-based infrastructure has made it possible to optimize server computing and storage capacity, as well as significantly increase system availability, with always-on features. An integral part of the project is a disaster recovery solution, with which an infrastructure is being built which will be absolutely reliable in terms of applications. For example, it is possible to perform maintenance operations on the data center without any impact on the operation of systems and applications. “We can shut down a data center and keep applications running,” says Davini.

The new architecture is now almost entirely functioning, although some configurations have yet to be optimized and new services await completion. Thanks to the new virtualized data center, the University of Pisa has one more asset: an agile and flexible infrastructure for teaching, an important element to ensure teachers and students an advanced experience of creating and sharing knowledge .

“When you turn a new service on, technology gives you great emotions”, concludes Maurizio Davini. “We are living in a moment of great technological evolution: in virtualization, in storage, in hyperconvergent systems. We enter a new world, and VMware, with its software, its people, its partners, is an integral part of this reality”.

