

# University of Salerno builds next generation data center to improve education services



EXECUTIVE SUMMARY
<b>CUSTOMER NAME</b> · University of Salerno
<b>LOCATION</b> · Salerno, Southern Italy
<b>INDUSTRY</b> · Education
<b>COMPANY SIZE</b> · 45,000 students and employees
<b>BUSINESS CHALLENGE</b> · Maintain a reputation for providing high quality, high performance education support services · Meet the demand for more and better computer services and applications · Increase access to educational resources without increasing risk to system security
<b>NETWORK SOLUTION</b> · Cisco Data Center 3.0 · Cisco Data Center Networking · Cisco Storage Area Network · Cisco Application Networking Services · Cisco Self-Defending Network
<b>BUSINESS VALUE</b> · Protects the University's reputation for providing leading-edge services to students · Increases education application performance by 30 percent · Increases access to education resources without compromising security · Simplifies and reduces the cost of data center operations · Reduces data center carbon footprint

A Cisco Data Center Networking solution is helping one of Italy's top ten universities, the University of Salerno, protect its reputation as a modern and advanced seat of learning by improving the performance and quality of its education services and applications.

## Business Challenge

The University of Salerno, in Southern Italy, can trace its history back to the 10th Century when the Salerno Medical School had established itself as one of Europe's pre-eminent centers for medicine. Today, the University has around 43,000 students studying a wide range of subjects including economics, science, engineering, language, law and medicine. The University is located over two sites just outside the city of Salerno in the Irno Valley. Among its modern, well equipped campus facilities is the Eduardo R. Caianello Library which, with over 400,000 books, is one of the most important literary collections in Italy.

The University of Salerno has a reputation for providing its students and staff with a broad range of high quality teaching and learning support services. These include online communication between lecturers and students, online access to teaching resources and development of a wireless network across the two campus sites. For example, foreign students at the University are offered an e-learning course in Italian to support their main course work.

Increasing demand to enhance existing services and develop more, and the corresponding demand on computing resources to support this, led the University to overhaul its networking infrastructure. Demand is being driven by the need to support more complex and powerful education services. This includes filming key lectures and sharing the video online, enabling students to use sophisticated film and video computers for studying new media subjects and improving access to innovative education material like video, online libraries and interactive learning applications.

### Network Solution

The University of Salerno has, for some time, used Cisco for its networking resources. Latterly, it has based its data center networking strategy on the Cisco Data Center 3.0 vision which has given the University a framework for building, implementing and operating a virtualized, next generation data center.



The latest phase of this strategy has been deploying Cisco Nexus 7000 Data Centre switching which enables the University to deliver 10Gigabit Ethernet today, and opens the door to future migration to a unified fabric in its data center. The University of Salerno chose the Cisco Nexus 7000 for its availability, reliability and performance. System availability is critical to maximizing uptime for accessing educational material and the high-availability features of the Cisco Nexus 7000 are especially valuable.

In addition, the Cisco Nexus 7000's Zero Service Loss Architecture helps ensure that the IT department is protected from the impact of network downtime. Optimized for 10Gigabit Ethernet, the Cisco Nexus 7000 also provides the performance that is needed to support bandwidth-intensive education applications. The Cisco Nexus 7000 also provides the University with forward investment protection. Although the switch is optimized to 10Gigabit Ethernet today, it is designed to support future standards such as 40Gigabit or 100Gigabit Ethernet.

Salvatore Ferrandino, IT manager at the University of Salerno says, "We see the Cisco Nexus switching technology as the cornerstone of a next generation data center strategy. Cisco Nexus is important because it is helping us develop an intelligent network to consolidate and virtualize disparate data center resources into shared resources groups. Our future goal is to implement end-to-end fiber channel over Ethernet connectivity to simplify cabling and network management."

The University's Cisco Data Center 3.0 strategy also includes application networking services (ANS) and storage area networking (SAN). The Cisco Application Control Engine (ACE) helps improve application performance by distributing services across multiple virtual devices, reducing data center power consumption and provisioning cycles. Benefits of the Cisco ACE product family include reducing costs through faster provisioning and scaling of applications and faster application and server performance. The University has developed two Cisco SANs to help manage data storage more efficiently and reduce the number of storage devices required.

**"Cisco's data center vision and its networking technology are playing a critical role in enabling the University to deliver better, faster and more efficient services that further enhance education."**

**Salvatore Ferrandino, IT Manager, University of Salerno**

The University's data center, located on the Scisciano campus, has around 140 physical servers and 90 of these are virtual servers using VMware Infrastructure 3. The SAN has a storage capacity of 6 Terabytes and is based on Cisco MDS 9000 Series Multilayer Switches which extend fiber channel connectivity across two sites for disaster recovery. The entire campus Local Area Network (LAN), which includes a Cisco Unified Wireless solution and covers both University sites, is based on Cisco technology. Over the network, the University is deploying a Cisco Unified Communications system which will eventually support around 2200 Cisco Unified IP handsets.

A key element of the Cisco data center solution is a Cisco Self-Defending Network where security is integrated throughout the network infrastructure. This approach to information security helps ensure every element in the network acts as a point of defense; that innovative behavioral methods automatically recognize and adapt to new types of threats; and various network components work together to provide new means of protection.

The Cisco data center networking solution at the University of Salerno has been implemented by Maticmind S.p.A, a Cisco Gold Certified Partner.

## Business Results

"The University of Salerno has established a reputation for supporting teaching, learning and living at the University with modern buildings and efficient services. Maintaining that reputation means staying at the cutting edge of innovation," says Ferrandino. "Cisco's data center vision and its networking technology are playing a critical role in enabling the University to deliver better, faster and more efficient services that further enhance education."

The Cisco data center networking infrastructure is helping the University to reduce costs, improve education application performance and make computing system management more efficient. For example, Ferrandino has seen a 30 percent performance increase, across the board, since deploying the Cisco technology. This has meant faster access to e-learning applications and improved access to online learning facilities for students.

Professor Cattaneo, head of the University's research network facilities, says, "We look for a trade-off between security and efficiency and the Cisco next generation network provides us with a more sophisticated mechanism to authenticate end-users before granting access to core resources. Even if we let students access laboratory devices connected to the network, there are no security holes to threaten critical services. On the other hand, increasing security means a more reliable service therefore improving overall business continuity. This means we can move more services on to the campus network gaining efficiency and reducing total cost of ownership."

Professor De Santo, chancellor of ICT at the University says, "I always try to look ahead to see what is new and exciting and show this to my students. Looking at Cisco solutions is a must if you want to understand and face the challenges of the future and Cisco Nexus is a good example of what is going to become a standard approach in managing large and complex networks. I can show my students that we have a big, complex and up-to-date network which is well managed. We look at the future and Cisco is always a piece of it."



Cisco ACE has made managing applications much easier. Because it provides network virtualization in a similar way to server virtualization, it releases applications from dedicated, physical servers and shares them across multiple network devices. This allows the University to ensure better and more reliable performance so that students using applications, like interactive e-learning, experience near real-time responses. Cisco ACE also means reduced application down time because upgrade and maintenance can be performed without shutting an application down.

## PRODUCT LIST

### Routing and Switching

- Cisco Nexus 7000 Series Switches
- Cisco Catalyst 6500 Series Switches
- Cisco 7600 Series Routers

### Application Networking Services

- Cisco ACE Application Control Engine Module

### Security

- Cisco Catalyst 6500 Series Firewall Services Module

### Storage Networking

- Cisco MDS 9500 Series Multilayer Directors

Using Cisco's Self-Defending Network security solutions has enabled the University to open up more computer resources and applications to students and expand its campus wireless network while providing greater protection against threats like viruses.

The Cisco MDS 9000 based SAN, which enables data storage to be shared across multiple devices, means fewer storage devices and better use of those which are needed. Reducing data center hardware has had a significant impact on reducing data center carbon footprint because there is less demand on power and cooling.

Because of the performance, density and availability features of the Cisco Nexus 7000, the University can

simplify its data center network infrastructure and reduce capital expenditure. This translates into lower operating costs and a reduction in total cost of ownership. Cisco Nexus high-availability features mean the network reconfigures itself with zero service disruption while the high port density and line-rate, 10Gigabit interfaces increase the scalability of the data centre solution. Cisco Nexus has also increased return on investment through more efficient and effective use of data center resources.



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