University of Pisa selects Arista for its largest networking upgrade in decades as its moves to software defined architecture

Highlights

Challenge

With a need to consolidate its data centre footprint while improving network provisioning, flexibility and performance, the University of Pisa selected Arista to deliver a software defined networking approach to create a scalable foundation for the future.

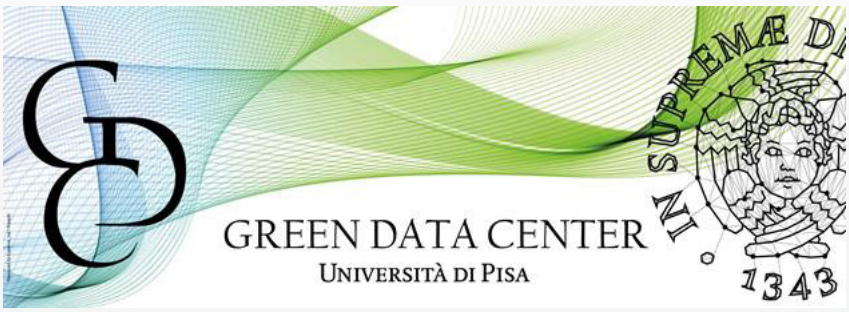
Solutions

- Arista 7280R for DCI for high performance, deep buffers, and scale
- Arista 7160 and 7050X3 for Data Centre leaf and spine, high performance, low latency and scale
- Arista 7050X3 and 7020R for Edge deployment and connectivity
- CloudVision to orchestrate and automate the network, plus monitoring with telemetry and analytics of Arista EOS

Results

- Improved performance and reliability with capacity to grow with demand
- Open, standards-based API to allow for future SDN and automation requirements
- Minimal learning curve allowing networking teams to transition skill sets
- Increased visibility, improved MTTI and response to faults with proactive methodology in troubleshooting networking and application issues

As one of Europe's leading educational institutions, the University of Pisa chose Arista to upgrade to a software defined networking architecture to improve flexibility for service provisioning and dramatically boost performance and reliability.



Project Background

Established in the 14th century by Pope Clement VI, the University of Pisa is one of the oldest public educational institutions in Italy and among the 20 oldest surviving universities around the world. The university has been recognised for its research centres internationally and prides itself on being the first university to launch a computer science degree in Italy.

Challenge

With over 46.000 full time students and nearly 3,000 staff, the university offers a wide variety of subjects including law, cultural studies, engineering, medicine, and business administration - taught in twenty departments. The academic institution also includes 17 libraries and 13 museums.

In terms of IT infrastructure, University maintains over 20.000 computer cores and 7 petabytes of storage with multiple data centres connected over a network spanning 9,000km of proprietary/owned fibre optic cabling. The university has grown considerably over the last few years and decided that it needed to consolidate several of its data centres that were fast running out of physical space.

In addition to the data centre consolidation, the complexity of the university network was starting to cause management challenges and impact performance. The university has over 50,000 computer cores distributed across 700 smaller data centres and the ability to move workloads around via its MPLS network was not particularly flexible. Instead, the University decided to move to an ethernet based virtual private network (EVPN) and Virtual Extensible Local Area Network (VXLAN) as a method of improving flexibility, scale, and performance.

This major project also aligned with a wider strategy to aggregate IT used by public administration for the region into the university's computer network to offer better economies of scale for public sector IT delivery.

Solution

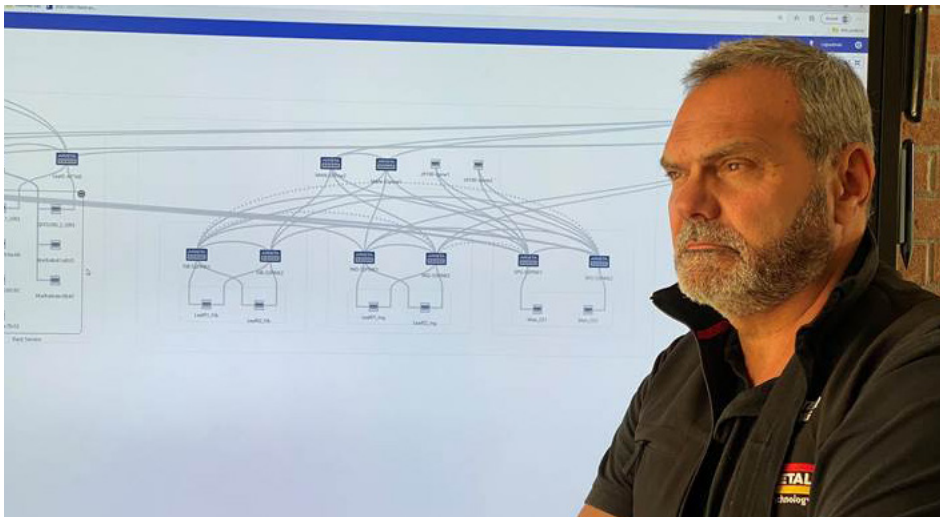
With such a large and far reaching project, the IT department instigated a deep technical investigation of possible switching/routing technologies and vendors. As Stefano Suin, CEO/CTO Digital Infrastructure for the University of Pisa explains, "We looked at almost every vendor you can think of and tested performance, expandability, features and, of course, looked at the future roadmap. Based on months of testing and evaluation, it was clear to us that Arista offered the best fit for our needs and a path to grow in line with the needs of the university."

One of the key features of value to the University was the Multi-Chassis Link Aggregation (MLAG) capability offered by Arista. This allows all network interconnects to function in an active/active manner and any two Arista 7000 Family switches to act as one logical switch for the purpose of L2 protocols such as STP or LACP. This has many advantages including

no wasted bandwidth with uplinks in Spanning Tree Blocking state or the ability to design non-blocking networks. The Arista implementation also uses no proprietary protocol to connect an MLAG pair to servers or other switches.

The use of deep buffers also offered the University plenty of scope to grow while the dense port design proved space efficient for their limited data centre footprint.

In total, the University deployed different Arista Series switches like 7280 for the DCI to interconnect their main three DCs, 7160 and 7050X3 Series as the core of its new data centre along with Arista 7020R Series switches at many of its smaller data centre locations. The new network is based on a meshed 100GB core using a leaf and spine architecture within a software defined networking topology.

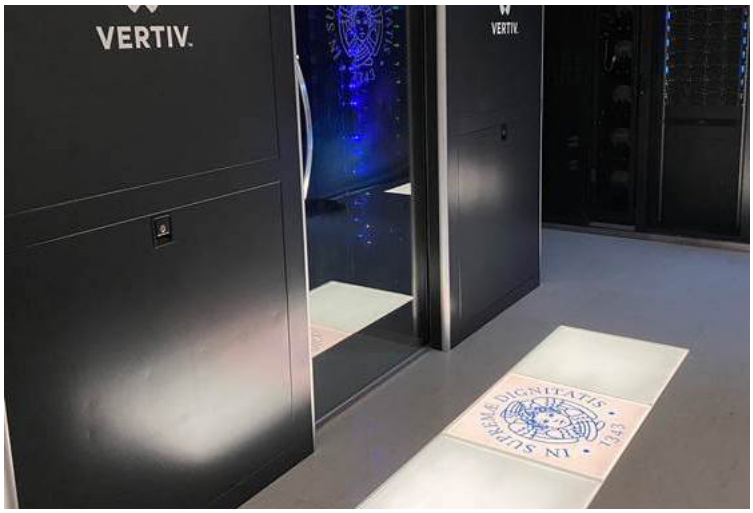


Conclusion

We have dramatically improved the flexibility of our network," explains Suin. "We now have the ability to deploy new types of network services and workflows without having to physically alter the network design. The network is also highly resilient against failure with a path towards 400GB as it becomes viable."

The success of the data centre project has prompted the university to examine additional ways it can improve other network related areas. One such use case is edge computing where network traffic can avoid having to transit via the core data centre to improve application performance and reduce network congestion. Another project under consideration is a migration of its WiFi network that includes over 1,000 access points on to an Arista based controllerless network design to improve access and performance for students, staff and several Internet of Things (IoT) initiatives underway at the university.

"This has been a successful project for the university that has helped us create a solid foundation to deal with new challenges," says Suin. "The technical team from Arista has helped us across the entire project and we look forward to working together into the future," he concludes.



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