

Juniper Technology Powers Irish University's New Campus and Data Center Network

Summary

Company:

Maynooth University

Industry:

Education

Business Challenge:

Maynooth University needed to:

- Connect additional buildings across its campus
- Increase its network performance and support flexible BYOD usage
- Build a resilient and scalable data center network that could also securely connect to applications in outsourced data centers

Technology Solution:

The solution was built using:

- [SRX Series Services Gateways](#)
- [QFX5100 Switches](#)
- [EX4300 Ethernet Switch](#)
- [Junos Space management applications](#)

Business Results:

- Greater network throughput, scalability, and application performance with much lower latency
- Significant amounts of reclaimed rack space lowering power consumption
- A fully redundant data center network that can securely connect to its outsourced applications

Maynooth University, part of the National University of Ireland, is an internationally recognised research university with a community of 800 staff and over 9,000 students from 85 countries. Maynooth is located 25 km from Dublin. The university traces its origins to the foundation of the Royal College of St. Patrick in 1795, with a heritage that includes over 200 years of education and scholarship. Maynooth University has a reputation for research in the fields of humanities, social and spatial sciences, mathematics, communication, computation, and health. These are complemented by strong departments and programmes in teacher education, computer science and electronic engineering, business, and law.

Business Challenge

Maynooth University is expanding and has recently added a number of new buildings to its campuses to create more teaching space and new residential accommodation. These include a new facility to house both its IT department and the academic computer science department, and the expansion of buildings has resulted in the university needing a new campus core network to interconnect them. In addition, the growth in user traffic has increased its capacity needs to 10GbE and beyond. Also, the increasing use of Office 365 and adoption of BYOD technologies have led to traffic becoming far less predictable.

As Dearbhla O'Reilly, ICT infrastructure manager at Maynooth University, explains, "In the past, users on campus really only needed to access our own servers, but now much of our students' traffic is leaving campus and returning via our own Internet connections. We got to the point where we needed far more capacity for our users but also more flexibility."

"Support from day one design right through the implementation and beyond has been fantastic. We've always had access to somebody with the expertise to address any issues. Now we have a new firewall, data centre, and core—and we have the Junos Space Management platform to help us understand how the network will evolve."

Dearbhla O'Reilly, ICT Infrastructure manager, Maynooth University

The university also needed to build a separate data centre network. It had been running its data centre over a collapsed core, which wasn't sufficiently scalable, reliable, or redundant to meet the university's needs going forward. The virtualisation of IT resources within its data centre also meant that it needed to provide 40GbE connectivity to

compute and storage. Maynooth University data centre operates from two separate locations on campus and wanted to take advantage of that separation to ensure that the new network had a robust disaster recovery solution. Upgrades to its Finance and HR systems, which are located in third-party data centres, also needed to be accessed over the same backbone.

Technology Solution

Maynooth University had already deployed [Juniper Networks® SRX Series Services Gateways](#) to provide flexible, secure connectivity and robust firewall functionality. The positive experiences influenced Maynooth's decision to build out its new core and data centre networks using Juniper Networks systems.

It built its data centre network using [Juniper Networks QFX5100 Switches](#) to provide a data centre core, with copper connections served by [Juniper Networks EX4300 Ethernet Switch](#) in a Virtual Chassis configuration. Juniper's Virtual Chassis technology can be used to connect multiple EX4300 switches as a single, logical device, delivering a scalable solution perfect for data centre installations. The EX4300 can be combined with other EX Series Ethernet Switches in the same Virtual Chassis to support mixed 1GbE and 10GbE environments. The EX Series carrier-class switching solutions are ideal for converged enterprise branch offices, campuses, and data centres, as well as for service provider deployments. QFX Series switches are high-performance, high-density platforms that are designed for top-of-rack, end-of-row, and spine-and-core aggregation deployments in modern data centres. They can be deployed as 10GbE, 40GbE, or 100GbE access, spine, core, or aggregation devices in Virtual Chassis, Virtual Chassis Fabric, multichassis link aggregation (MC-LAG), and [Junos® Fusion](#) architectures.

"We wouldn't change anything about our implementation. We've implemented a new live core, new perimeter routers, and gone through a live data centre migration involving multiple vendors' equipment in critical roles. Support from Juniper and its partner Agile has made it all work painlessly and has given us a networking platform to support all our future needs."

Patrick O'Regan, Network Coordinator, Maynooth University

The university's campus core network is based on QFX5100s, which has allowed Maynooth University to move from a Layer 2 switched environment to a Layer 3 routed model. As Patrick O'Regan, network coordinator at Maynooth University, explains, "As the physical campus expanded, adding more switches meant we were always playing catch up. We needed a proper campus-wide routed model but we also wanted a router with high packet per second throughput that would scale for the future."

Dearbhla O'Reilly adds, "With Juniper we could build all of our network solutions with just two types of equipment, which makes it much easier for us to operate our networks."

The university has extended access to its finance and HR systems using VPN technology to securely connect its own data centre to its outsourced data centres. "The new network allows us to expand our IT services as we need to. We are now able to extend our VPN connectivity securely and without any incremental investment," O'Reilly says.

The project was delivered by Agile Networks, Juniper's Elite Partner in Ireland. "We worked closely with Maynooth to make sure their new network supported their business goals," says Darragh Richardson, managing director of Agile. "Our significant experience with Juniper ensured we could design and deliver the right network, with the right features, and the right commercial model. Like any good partnership, the key to successful implementation was clear communication and commitment to ensure the project was delivered to meet Maynooth's expectations."

Patrick O'Regan adds, "Agile helped validate our ideas and carried out feasibility studies for us. We always had direct contact with an engineer throughout the entire process."

Maynooth University also uses [Junos Space Management Applications](#), easy-to-use applications that optimise network management for various domains in service provider and enterprise environments. Junos Space applications provide the university network with error-free service provisioning, simplified network operations, and automated troubleshooting.

Business Results

Both students and staff at Maynooth University now enjoy much greater network throughput, improved application performance, and a massive reduction in latency. Resilient connectivity and increased bandwidth enable the research community to transfer extremely large data sets that are terabytes in size. "People started remarking on it as soon as it went live. We didn't even have to publicise it, people immediately saw the difference," O'Reilly says.

The university also regained significant amounts of equipment rack space, benefitting from greater functionality in a single 1 U device than it had previously had with the chassis-based systems that were replaced. "The whole solution is much more cost effective, uses far less power, and is fully redundant," O'Regan says. "The ease of setting up was fantastic compared to what we had been used to. The next application will simply slot into our design so we don't need to go through a new design phase every time we add a building or an application. We know we can simply scale in all dimensions."

Maynooth University also found interworking with Juniper very straightforward during the network transition. "Juniper's implementation of open standards turned out to be really important," O'Regan says. "And any of our staff that had UNIX experience found they could also use the network equipment because they intuitively understood it, which allowed us much more crossover between the IT and network sides of our department than we had anticipated. Consequently the whole transition was much more painless than we expected."

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Darragh Richardson, Managing director, Agile Networks

Next Steps

"Support from day one design right through the implementation and beyond has been fantastic," O'Reilly says. "We've always had access to somebody with the expertise to address any issues. Now we have a new firewall, data centre, and core—and we have the Junos Space Management platform to help us understand how the network will evolve."

The university is also keeping a watchful eye on developments in software-defined networks (SDN), which was an important checklist item in its decision making criteria.

As Patrick O'Regan concludes, "We wouldn't change anything about our implementation. We've implemented a new live core, new perimeter routers, and gone through a live data centre migration involving multiple vendors' equipment in critical roles. Support from Juniper and its partner Agile has made it all work painlessly and has given us a networking platform to support all our future needs."

For More Information

To find out more about Juniper Networks products and solutions, please visit www.juniper.net.

About Juniper Networks

Juniper Networks is in the business of network innovation. From devices to data centers, from consumers to cloud providers, Juniper Networks delivers the software, silicon and systems that transform the experience and economics of networking. The company serves customers and partners worldwide. Additional information can be found at www.juniper.net.

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