# HEAnet provides high speed broadband to over 350,000 pupils in Ireland

## Summary

**Company:**
HEAnet

**Industry:**
Education

**Callenges:**
- Support the Irish government to provide digital learning to 730 secondary schools
- Provide the required Web filtering capabilities to protect children from inappropriate content
- Deliver a cost-effective infrastructure capable of providing 100 MB bandwidth to each connected school, even those in remote areas

**Selection Criteria:**
After looking at key players and recent developments in the market, HEAnet settled on Juniper Networks and its partner, Agile Networks (Agile), to implement a cost-effective infrastructure that was secure, reliable, and fast for its schools.

**Network Solution:**
- Juniper Networks SRX3600 Services Gateway
- Juniper Networks MX480 3D Universal Edge Router
- Juniper Networks SRX240H Services Gateway
- Juniper Networks Secure Analytics[1]
- Juniper Networks Junos Space
- Juniper Networks Junos Space Security Director

**Results:**
- Improved digital teaching and learning for 350,000 students and 26,000 teachers and staff
- Project was delivered on time and under budget

## Bringing the Digital Revolution to Secondary Education

Ireland has long been committed to providing cutting edge Internet and associated IT and e-infrastructure services to its educational and research institutions. As a result, all of the Irish universities, institutes of technology, and other higher education institutions are connected by a high bandwidth network. They don't just interlink, but also enable successful collaboration with fellow national educational and research networks in Europe, the U.S., and the rest of the world.

In contrast to this, primary and secondary schools enjoyed more modest levels of broadband. Indeed, under the first phase of a school's broadband program in 2005, broadband levels in the region of 0.5 to 2 Mbps of bandwidth were targeted, with many schools in rural or remote locations of the country relying on satellite technology.

With growing trends towards e-books, bring-your-own-device (BYOD), Wi-Fi, and cloud computing, schools were in need of greater bandwidth levels, so the Irish government made a strategic decision to invest €40M in Information and Communications Technology (ICT) for education, which encompassed the initiative to bring enhanced digital learning to its 730 secondary schools, albeit in challenging economic times. With the objective of leveraging HEAnet's existing backbone network and expertise, the government turned to HEAnet for the implementation and management of the large-scale network that would be required.

*"The Juniper Unified Threat Management solution as proposed by Agile was the one that performed best against our evaluation criteria, which encompassed technical, manageability, support, and cost factors. We also thoroughly tested equipment to validate performance and throughput levels under a variety of test scenarios. Further, because of the dispersed nature and number of school locations, ease of management was key for us, as configuration changes need to be pushed through regularly and transparently to the schools."*

**Ronan Byrne,** CTO, HEAnet

[1] Formerly STRM Series Security Threat Response Managers

## The Search for the Best Solution

Established in 1984 by the Irish Universities with the support of the Higher Education Authority, HEAnet provides an essential e-infrastructure service across all levels of the Irish education system. Ronan Byrne, Chief Technology Officer of HEAnet, explains why they are so ideally positioned to take on this huge task: "Having worked with the higher education sector for more than 15 years, we have strong expertise and experience, not to mention the physical infrastructure of a high quality, highly available backbone network with a nationwide reach—all of which can be leveraged to connect secondary schools."

Thanks to its previous experience, HEAnet was very aware of the solution requirements, especially with regard to Web filtering, which is an essential tool to protect children from accessing inappropriate content when online, and the ability to provision a multitude of devices and performance demands, particularly around peak times in schools such as the start of the day. As schools tend to follow the same usage patterns, the network solution needed to efficiently handle simultaneous logins and similar peak traffic periods.

HEAnet's procurement approach encompassed a technical dialogue phase where key players in the market were invited to advise on the latest product developments. Juniper Networks' partner, Agile Networks (Agile) proposed a mix of the Juniper Networks® SRX3600 Services Gateway, SRX240H Services Gateway, and MX480 3D Universal Edge Router, combined with Junos® Space, Junos Space Security Director, and Secure Analytics. This end-to-end network is based on core, aggregation, and access layers, and it provides full routing, switching, firewall, filter, management, and monitoring capabilities. Broadband connectivity is provided via a variety of service providers, deploying both fiber and wireless technologies. The bandwidth is required to be symmetrical in nature, allowing 100 Mbps upstream and downstream capacity to and from each connected school.

## Partnering with Juniper Networks R&D

Byrne explains his decision to partner with Juniper Networks R&D: "The Juniper Unified Threat Management solution as proposed by Agile was the one that performed best against our evaluation criteria, which included technical, manageability, support, and cost factors. We thoroughly tested equipment to validate performance and throughput levels under a variety of scenarios. Furthermore, because of the dispersed nature and number of school locations, ease of management was key for us, as configuration changes needed to be pushed through regularly and transparently to the schools."

The project started with an implementation phase which included 78 carefully selected schools across the country. This phase validated performance levels across highly populated schools and also rural schools (including four island schools), to ensure that even the most remote schools were able to benefit from the solution. All Irish counties were represented in the first phase to ensure nationwide coverage.

The integration with other incumbent technologies presented some unique challenges for the Juniper solution. Agile worked closely with Juniper R&D to remedy these early issues, and this influenced the development of the product set, which now benefits all users. Today, Juniper has established a replica of the HEAnet school network within its own testing environment, to ensure that new code continues to deliver high-performance output. Byrne comments on the response of both Juniper and Agile: "In a project of this size and complexity, issues are inevitable, but it is how these issues are addressed that is the real test of the partnership. I was very impressed with the escalation channel as initiated by Agile, straight into Juniper's R&D teams, resulting in efficient remedial action when required. Everyone worked together and energies were always focused on moving forward. The approach was very collaborative and gave us the confidence that we were all heading in the same direction."

Agile and Juniper also facilitated training for the HEAnet team, so that they were fully prepared ahead of the network rollout. This not only gave them a good understanding of the equipment purchased, but was also an opportunity to customize the solution in the context of this unique project.

## Security is Paramount

The ability to filter Web content is critical to this solution, and a specialist HEAnet capability. A strict filtering policy is prescribed by the Irish Department of Education & Skills, and a school does not gain Internet access until it has subscribed to one of the defined filtering levels. The Juniper Networks SRX Series Services Gateways platform, in combination with a cloud filtering service, allows a school to select from a range of filtering levels. Using the monitoring capabilities of Junos Space and Secure Analytics means that an undesirable event on the network can be tracked and traced to ensure effective follow-up. The Juniper antivirus engine provides an additional layer of protection for the schools.

## Realising the Digital Potential

Tremendous changes are already taking place in the schools connected by HEAnet. Vastly improved access to Internet and online resources is a great step forward in itself, presenting enhanced learning opportunities via the use of Web streaming and secure browsing. However, initiatives are extending beyond the obvious use cases—one school has forged an online alliance with the Massachusetts Institute of Technology (MIT) in the U.S., while another group of schools have introduced a centralized SharePoint solution through cloud computing, enabling them to share content. Island schools are collaborating with sister schools on the mainland and are able to share resources and even teachers by way of video links.

Some schools have paired up with schools across Europe and are holding video conferences that are enabling students to improve their oral foreign language skills.

Further evidence of the program's success lies in the Web traffic statistics, which show that the first 78 connected schools are now responsible for 30% of the total schools traffic over the HEAnet network, which represents some 3,900 schools in total. Once all 730 secondary schools are connected, this network will support over 350,000 students, as well as 26,000 teachers and staff throughout Ireland.

*"We are very pleased with the success of the programme thus far. The partnership with Agile and Juniper has worked very well, and schools and students around Ireland are benefiting as we speak. I think the use cases we are going to see are ones we cannot even imagine today, particularly around collaboration. HEAnet is proud to be able to facilitate new innovations in Irish schools, all within a highly secure, reliable, and fast environment."*

Ronan Byrne, CTO, HEAnet

## Next Steps and Lessons Learned

"We are very pleased with the success of the program- thus far," Byrne says. "The partnership with Agile and Juniper has worked very well, and schools and students around Ireland are benefiting as we speak. I think the use cases we are going to see are ones we cannot even imagine today, particularly around collaboration. HEAnet is proud to be able to facilitate new innovations in Irish schools, all within a highly secure, reliable, and fast environment."

## 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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3520446-002-EN  June 2015

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