

Janet: Securing UK research and education's e-infrastructure for the decade to come

Summary

The Janet network is provided by Jisc, which delivers digital solutions and IT infrastructure to the UK education and research community. As a shared service across the UK, it has been providing connectivity for research and education for more than 30 years, enabling significant cost savings to the sector.

The current version of the Janet network, from a project known as Janet6, began full service in October 2013 and now serves more than 18 million users across research, HE, FE and schools. It was delivered on schedule and to budget.

Success factors

The Janet network meets the most challenging demands of high end research, whilst providing the best infrastructure for the breadth of education and research. This means it can respond to the changing needs of the community – enabling it to meet bandwidth requirements as they arise, exploit the efficiencies of new technologies (such as cloud), allowing new ways of working, and respond to policy changes.

The network has also been designed to address future demands for high capacity connectivity, allowing vast amounts of data to be exchanged in seconds. Janet6 was one of the first networks in the world to run a production service at multiple 100Gbit/s.

Over decades, having the Janet network has meant that universities and colleges can rely on network connectivity in the same way as they rely on utilities, being constantly available, reliable and scalable and capable of meeting their needs. However, what is often not appreciated is the complexity around the network; the cyber security services that monitor the network and advise organisations, the work with regulators and legislators to ensure that the infrastructure continues to be fit for the multiple purposes and services such as eduroam that mean staff and students can log on at most education establishments in Europe and beyond.

On the launch of Janet6 Martyn Harrow, chief executive of Jisc, said: “Our core mission is to advance and support the use of digital technologies in UK research and education for advantage. This leading edge network infrastructure is a fundamental component in

achieving this and will unlock new levels of ambition and collaboration on a national and international level.”

Investing in the future

The Janet network has developed over the years to meet the growing requirement of its users. In 2006 SuperJANET5 was launched as a highly available and advanced network infrastructure built on a 10Gbit/s backbone with an upgrade path to 40Gbit/s and to 100Gbit/s in the London part of its core.

Replacing SuperJANET5 with the current infrastructure means that the network continues to offer significant value to the community. Janet6 has enabled Jisc to exploit technology to achieve greater flexibility and get far more capacity for its investment – all at a cost saving of £30.3m per annum for the sector.

Sector cost savings

The five year investment in SuperJANET5 to deliver 1,752Gbit/s of backbone bandwidth was £43.8m which equates to £25k per Gbit/s. The equivalent figures for Janet6 are 8,000Gbit/s and £6k per Gbit/s. Developing SuperJANET5 to provide the same 8,000Gbit/s capacity would have cost £200m rather than the £48.5m possible with Janet6 technology. This represents a cost saving of £30.3m per annum (£41.5m if increased costs per Gbit/s are taken into account).

Tim Kidd, executive director, Jisc Technologies explains: “We operate a highly specialist network based around the needs of our research and education providers. Whatever the project, the people we work with want the best datasets ‘on demand’ so it is vital that we continually invest in our network to ensure we’re able to provide good connectivity, low latency and high bandwidth at all times.”

Networked services

The 18 million strong user community also has access to a wide range of Jisc services that have been procured on its behalf, saving both time and money.

An example of this is the five year deal (extendable for up to a further 10 years) to establish a shared data centre; a ground breaking initiative to drive down costs through aggregation and create an environment for innovation and collaboration between organisations across research and education. The facility will provide a cost-effective solution to co-locate systems and services that could save the sector between £12m - £60m in a five to ten year period.

Other benefits to the community include cloud services, collaboration services such as the Janet telephony purchasing service, Jisc's videoconferencing service v-scene and value-added connection services, including authentication and authorisation, security and ISP services.

The range of services facilitated by Jisc allows individuals and organisations to push back the traditional boundaries of teaching, learning and research methods for example by the use of virtual learning environments and remote lessons. E-infrastructure also helps the advancement of the UK's research base through access to resources such as managing large amounts of data, sharing of data through collaboration with partners or carrying out complex experiments.

What the community says

"The Science and Technology Facilities Council (STFC) operates large-scale science facilities and support science programmes for UK research communities to deliver world-class research and innovation. This activity is highly data intensive and whether using the Janet IP Service or the Janet Lightpath Service, the requirement for a robust, resilient and extensible national network is fundamental for STFC to maximise its impact for the benefit of the UK and its people."

Dr Robin Tasker

Head of Networks and Communications, STFC, Daresbury Laboratory

"The Janet network is a key part of the UK higher education sector's research and teaching infrastructure. Securing this infrastructure on a long term basis allows the sector to plan for continued engagement with their research partners and commerce, and so further contribute to the economy."

Peter Tinson

Executive Secretary, UCISA

"Janet is a key part of the national infrastructure enabling the UK to deliver world-class higher education and research. Janet provides the communications network which enables these activities to make their vital contributions to the country's wellbeing at a time of economic challenge and uncertainty."

Sir Alan Langlands

Chief Executive of HEFCE

See how organisations in the community are using the network:

<https://www.ja.net/products-services/janet-connect/janet-connections/janet-case-studies>

How it all started

On 1 April 1984 JANET became the national research network, enabling researchers and academics in 60 universities and research councils to access high-speed internet

connections of 9.6Kbit/s. Seven years later this had increased to 2Mbit/s and in 1993 SuperJANET went live to become one of the fastest networks of its kind in the world.

From connections to 72 further education colleges in England and all of Wales, alongside 72 HE organisations in 1997, Janet6 now has more than 18 million users across the UK from research institutes, universities, FE colleges and schools. The original connections of 9.6Kbit/s are now 100Gbit/s and 200Gbit/s links with talk of going to 400Gbit/s. An amazing leap in such a short timeframe.

Janet6 was designed with commercial partners, including SSE Telecoms, Ciena and Imtech ICT responsible for the fibre, optical equipment and deployment of the network. The biggest transformation during the project was a vision to bring the optical transmission network in-house, with equipment provided by optical network specialists, Ciena. As a provider of optical technology, Jisc has greater management control, benefitting from direct access to design support, simulation and testing. There is no longer a reliance on any telecom provider services at the optical layer as well as at the IP layer which allows Jisc to build, manage, grow and provision its network independently and in a way that best fits the needs of its customers.

Contact

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