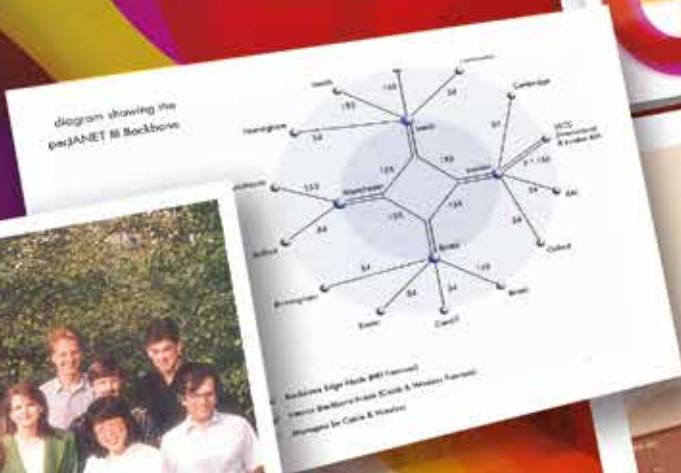


1984-2014

30 years of the Janet network



The rise of the Janet network

Back in the late 1980s and early 1990s, it was hard to imagine where technology would take us into the 2000s and beyond. At a time when the Internet was emerging to scoffs of 'it'll never catch on,' the world was a very different place.

Those working to establish the Janet network saw the possibilities; they knew the way technology was developing and now, looking back, are extremely proud to have been part of its evolution.

When the Janet network went live on 1 April 1984, the connections were 64kbit/s, now there are 100Gbit/s and 200Gbit/s links, with talks of going to 400Gbit/s. An unbelievable leap in such a short timeframe. So how exactly did we get from the first versions of JANET and SuperJANET to Janet6, and where will we go next?

Growing demands

Head of Network Operations, John Seymour, has seen the changes over all eight versions of Janet. 'In the early days we couldn't have imagined speeds like we're seeing now,' he says. 'Technology has come on so much. Expectations have increased dramatically and with bigger networks people can do so much more. Traffic is doubling every 18 months to two years – what will it be like in another ten?' The next leap will be Tbit/s Ethernet, and it won't stop there.'

To keep pace with customer requirements, the company has grown from an original core of just 30 people to over 150. 'This growth has meant we have been able to develop strong processes and procedures and more importantly raise our levels of customer service,' says John. 'We used to be just buried in technology and were doing it 'because we could'; now we're focused on providing a service for our customers. The network used to be something people thought they'd like to be involved in – now it's absolutely critical!'

“The network used to be something people thought they'd like to be involved in – now it's absolutely critical!”

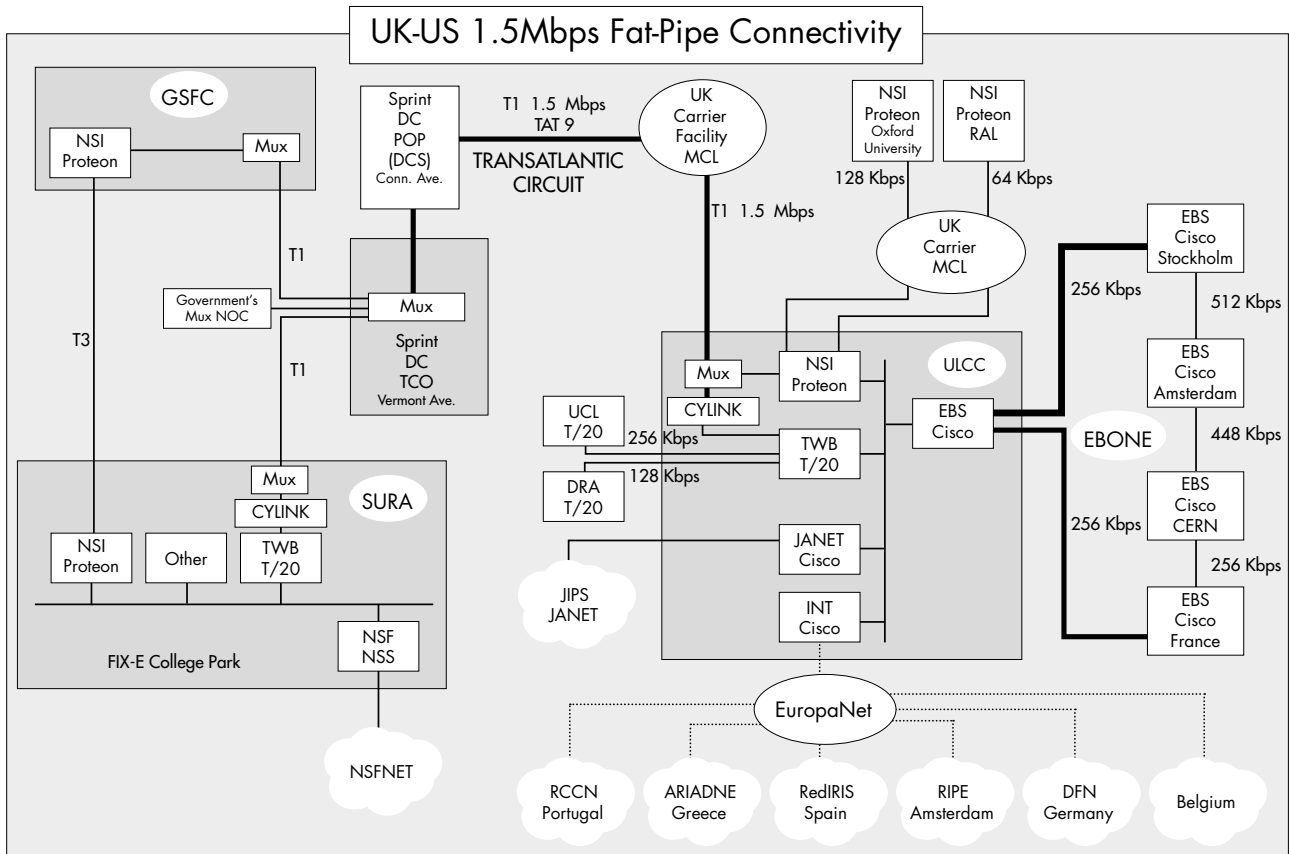
John Seymour,
Head of Network Operations, Janet

Building relationships

As Head of Customer Engagement and Support, Shirley Wood describes her years at Janet as 'exhilarating and challenging.'

Back in 1986, when Shirley joined, it was a very small community of around 55 universities and 20 research council sites. Shirley comments, 'it's taken a lot of time to build up relationships and contacts, but people now know who to talk to when they have a query or need help in achieving their goals. My objective is to know what the customer wants before they know they need it. By constantly looking at how we can deliver the best for research, FE and HE, we're developing the young people of the future.'





Natural progression

Being involved through all the versions of Janet, Sue Weston, Head of Procurement, has seen the evolution of the network and the way technology has come on. 'What I do has an impact on most of the business, so I get a good insight into how the technology has developed to meet customer needs. We know that it's essential to provide a seamless service that works for all of our customers and pride ourselves on being critical within the research and education community. Now our customers tell us that Janet is 'just there', that it 'just works' and that they can't do without it.'

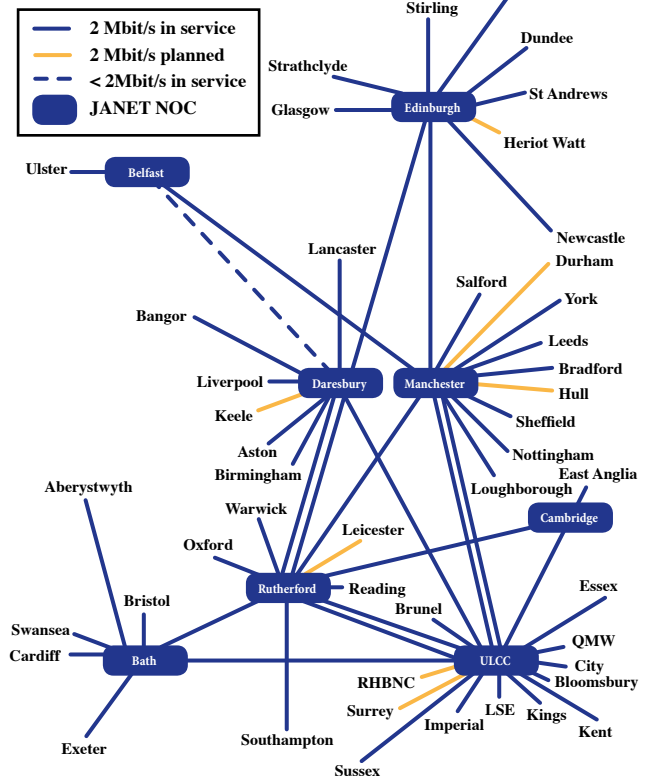
One step ahead

As Janet grew in the late 1990s, with the introduction of FE and the interest from schools, regionalisation changed its infrastructure. Jeremy Sharp, Head of Strategic Technologies, joined in 1994 and believes that the political changes that affected Janet contributed to its growth.

“Now Janet is 'just there'... it 'just works' and people can't do without it”

Sue Weston,
Head of Procurement, Janet

JANET MK II



State of the 2Mbit/s Connections to JANET at March 1992

“It broadened our scope and allowed us to serve the wider education community in addition to HE and research”

Jeremy Sharp,
Head of Strategic Technologies, Janet

‘It broadened our scope and allowed us to serve the wider education community in addition to HE and research’, he says.

Janet played a really important part in leading developments in computer networking in the early days. It’s now a very mature and fast-moving area, so it’s crucial to still be ahead of the game. Janet6 is a great example of this.

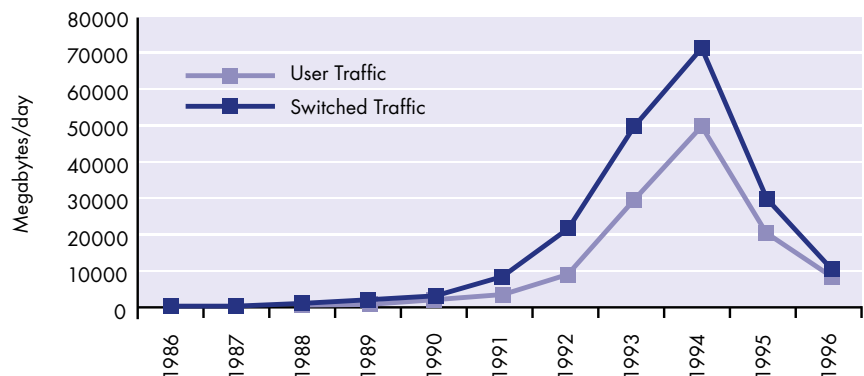
‘Over the years there’s been a real pioneering spirit, with the success of SuperJANET really moving us on’, says Jeremy. ‘Working in this environment you never stay still for long. I always had an eye on technology development, from the 1990s, but it’s still hard to grasp where we are today.’

Keeping pace

Professor Alistair Chalmers, first Chairman of the Advisory Committee on Networking, was involved with the creation of Jisc in 1990. He says, ‘My perception of Janet was extremely positive at that time and over the years has only become more so. Though some might now look upon the



Average JANET X.25 traffic per working day



technology then available as quite primitive, Janet was much envied in other countries and the network team was a team to be proud of.’

‘The changes since those days have been vast. Janet always was cutting edge, and I get the impression from afar that it has fully kept pace. It has done a particularly good job in implementing continual technical advances while at the same time maintaining day-to-day services, tailor-made for the research and education community,’ says Alistair. ‘Also, Janet engineers have managed to provide secure access to a huge variety of people and organisations. The combination of this special provision, together with seamless interworking with public and commercial service, has been fundamental to the network’s success.’

For the better

Janet has also been heavily involved in influencing and improving UK law from 1984, when it was blithely assumed that real-world legislation would simply transfer to networks, to 2014 when more than a dozen laws make special provision for them.

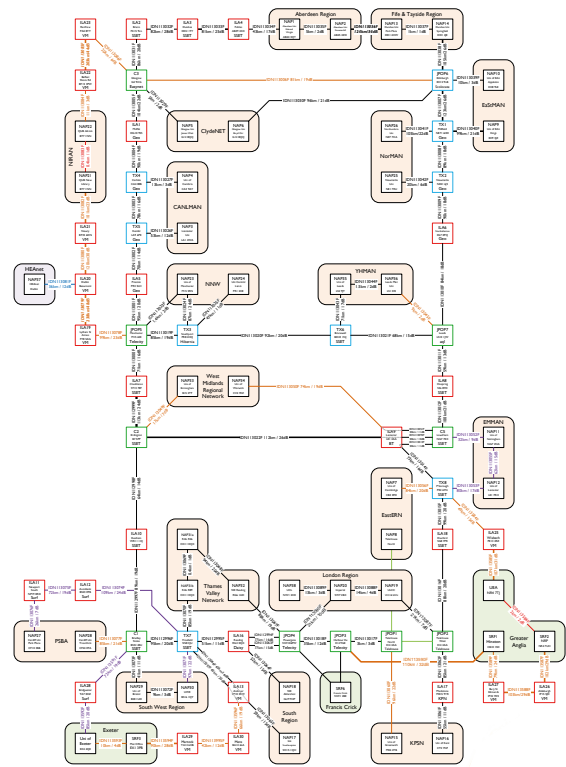
Janet has done what it can to ensure the effects are positive – improving network safety and security and recognising that not all networks and users are the same. As a result, newer laws clearly define illegal content and don’t place operators who find it on their networks and systems in an impossible position.

Nowadays those developing law and policy often seek Janet’s input, recognising our understanding of the technical and operational implications of online law. Working closely with customers lets us explain the implications for both backbone and organisational networks. Together, we are making the law better.

The evolution of the Janet network



SuperJANET SDH Network



Janet6 Network

25-year celebrations

Janet's impact over the last three decades has been documented in a book by Christopher Cooper: 'Janet: The First 25 Years'¹. Looking at the definitive history of Janet, from 1984 to SuperJANET5 in 2006, it makes a fascinating read. From its creation to its goals, this book gives an insight into how Janet has helped shape technology as we know it today.

A bright future

Over the last 30 years we've seen the rise of the network, as technology and the world has evolved. With demands only increasing and possibilities becoming endless, the future is certainly set to be exciting.

¹ <https://community.janet/groups/marketing-communications/article/janet-first-25-years>

“By constantly looking at how we can deliver the best for research, FE and HE, we're developing the young people of the future”

Shirley Wood,
Head of Customer Engagement and Support, Janet



Making a world of difference

During his 22 years at Janet, Chief Technology Officer, Bob Day, has seen unprecedented changes in global demand from both research and education. We spoke to him to find out how the network has evolved over the last two decades, to meet the ever-increasing need for international collaborations.

Bob, how did you initially see Janet's role in supporting research and education in the UK and internationally? And how has this changed over the years?

When I joined in 1992, there was, by today's standards, relatively little international interest among research and education in the UK. Janet was, though, very active and influential in developing technical networking and standards into Europe.

Then we started to see a lot more UK interest in international collaborations, particularly in research, and it's now inconceivable for any UK-based research or education facility not to have international activity – and international connectivity.

With many UK organisations now having overseas campuses and interests, how has Janet's role developed to support this?

We've increased our collaboration with other National Research and Education Networks (NRENs), as most countries have a common vehicle for their activities. It's only through technical expertise and experience that we're able to build relationships and expand our involvement. We now have a senior global partnership development role, focused solely on this.

How do you see Janet's role supporting the increasing need for high volumes of international data transfer, across research, education and industry?

Education is starting to globalise, with Higher Education organisations increasing their presence in other countries, particularly the Middle and Far East, including China.

Universities want to replicate the student experience, on a global scale – through access, IT facilities, learning materials and links to tutorials in the UK. We're supporting this by making links, extending Janet access and working with other peer organisations around the world to deliver Janet services.



Bob Day
Chief Technology Officer, Janet

“The big challenge is recognising the value and sensitivity of data and putting mechanisms in place to protect it, globally.”

In terms of research, we're moving into times where much of the data is not only of unprecedented volume, but increasingly extremely sensitive. For example, it may be patient information relating to medical research, or commercially valuable data relating to university/industry research partnerships. The big challenge is recognising the value and sensitivity of data and putting mechanisms in place to protect it, globally. Janet is currently highly involved in developing an international structure to make that happen.

Of the people you have worked with over the years, is there anyone you feel has been particularly influential in Janet's development?

There are many names, but within the UK two people – Howard Davies and James Hutton.

I worked with Howard in the mid-1980s; he was one of the founding members of DANTE. His influence was very important in setting the scene for, and building, the foundations of collaborations with NRENs, which is essential. Having previously been the Computing Centre Director at the University of Exeter, his influence, nationally, helped us really understand how to shape our services to meet the needs of our customers.

Again, in the mid-1980s, James Hutton was seconded to work in the pre-cursor of DANTE and was very influential in the early building blocks. When James came back to Janet following his secondment, he had a different view. As a result, he asked awkward questions, made people think differently and challenged the status quo in how we served the increasingly international needs of research and education. This was something I really admired.

Tim Marshall looks to the future

Since joining Janet, or UKERNA as it was in 2005, I've seen the world of technology in research and education change dramatically.

We're now operating in a world where people work in so many different ways, some of it only found in science fiction just 20 years ago. At the level of the individual user it's now quite normal to be using four or five devices, most of which will have mobile access. At the other end of the scale are assets such as high performance computing where the capability available today would have been unthinkable in 2005. Back then it took at least 10 days to process one gene sequence, today it takes just two hours... and it's got even faster since I wrote this.

As we enter this next phase, Janet(UK) will transform into the much more broad-ranging Jisc Technologies function as an integral part of Jisc, with a remit that goes beyond that of just networking. This function will rise to the challenge of harnessing the power of Janet to provide comprehensive Cloud services and other technologies in order to meet the needs of our customers in a world where almost anything that you imagine today becomes a possibility tomorrow. Increasingly data analytics, security and access and identity management are being seen as themes which feature in the wider Jisc Technologies remit.

Despite a somewhat hesitant start, there are now signs that the adoption of Cloud services is gaining traction in research and education as the early adopters utilise compute and storage beyond the walls of their own data centre. This is opening up a wealth of opportunities to our community as researchers and educators present us with requirements that cannot viably be provided by the commercial market. Our new broad offering means that UK research and education can keep pushing at the boundaries to ensure that our national knowledge economy remains at the cutting edge and punches well above its weight on an international scale.

One of the most enriching aspects of my role is that I see passion and commitment across our community. A great example of this was at Networkshop41 last year at Keele University. There were 300 people present and some expert speakers. I was invited to give the closing plenary and had planned to cover value for money giving significant

“People genuinely look to us as leaders in what we're doing, not just on a national scale but also internationally”



Tim Marshall
Executive Director, Jisc
Technologies & CEO, Janet

and favourable statistics for Janet, such as a 20 percent cut in budget since 2009, a 3,000 percent increase in traffic and a 4,000 percent reduction in unit cost. I was going to quote these impressive numbers, but then I changed tack and focused on the obvious and unique value of Janet. It was there sitting in front of me! 300 people in the room, none of whom were employed by the company, but who are all very much part of what we do. The value of these highly talented people and the enthusiasm of the Janet community with a strong common bond is what really matters.

When I'm asked about the thing I'm most proud of, there's no doubt in my mind that it's the fact that we're still here when so many other organisations have gone! People genuinely look to us as leaders in what we're doing, not just on a national scale but also internationally. Our work with other National Research and Education Networks and emerging transnational education programme is very important to us. We are able to give a great service through our international collaborations and we're proud to say that we're right up there with the leaders in the world of research and education networking.

I've been through various transformations at Janet, but the most exciting is the long overdue coming together of Janet and the refreshed joined-up Jisc. Bringing together digital enablement into one organisation will achieve great things across the sector and that's what we're all about. Being an integral part of the Jisc group creates not only immense value, but makes it even more possible to support the UK as a leader in the global knowledge economy.

Here's to the next 30 years...

30 years of the Janet network

2014 30 years of the Janet network

2013

- Janet6 launches
- Janet helps academia and industry to share expertise and e-infrastructure resources
- Janet launches trial to enable broadcasters to quickly access expertise from universities through live streams
- Janet connects performers from across the globe

2012

- Janet becomes part of the Jisc group
- An initial £30m e-infrastructure investment from the UK Department for Business, Innovation and Skills and the FE and HE funding councils makes the development of Janet6 possible
- Working with the BBC and NHK, the Janet network is used to broadcast key moments of London 2012 in Super Hi-Vision at various locations across the UK and around the world

2011 JANET rebrands as Janet

2009

- JANET becomes the first national research and education network (NREN) in the world to complete a 100Gbit/s network trial. Netsight, Janet's traffic monitoring system, is upgraded, showing the current and past performance of the network
- JANET has more than 1.8 million UK users including research institutes, universities, FE colleges and primary and secondary schools

2008

- Core network capacity upgrades to 40Gbit/s
- JANET wins the shared services category of the eGovernment awards, followed in April by a government computing award for innovation
- UK academics helping with the Big Bang recreation project at the CERN laboratory in Switzerland, receive data routed over Janet as part of the global collaboration

2007

- SuperJANET5 provides a 10Gbit/s backbone to the network and UKERNA becomes JANET(UK)
- Astronomers in Cambridge help to create a single telescope as large as Europe by working with colleagues in Italy and Poland through JANET's link to the GÉANT2 network

2004 UKERNA teams up with the BBC to stream the Olympic Games live from Athens across JANET

2003 English schools begin to link up via JANET

2002 Adult and Community learning organisations connect to JANET

2001 SuperJANET4 moves to 10Gbit/s infrastructure following £50m investment. JANET links to other European and worldwide networks through GÉANT connection

1994 The United Kingdom Education and Research Networking Association (UKERNA) takes over responsibility for JANET

1993 SuperJANET goes live – the fastest network of its kind in the world – and continues to be funded by the newly-renamed JISC

1991 Polytechnics and Further Education (FE) colleges start to link to JANET

1984 JANET enables researchers and academics in 60 universities and research councils to access high speed internet connections and a national research network for the first time