JANET *News*

Contents

Editorial

JANET serves the UK's education and research community. It is funded by UK taxpayers and a JANET connection is only available to UK organisations.

Why has JANET(UK) just appointed a Head, International Relations?

JANET is one of the world's leading research and education networks and has a great deal to offer – for example, becoming the first such network in Europe to install 40Gbit/s channel technology. At the same time, we are aware that the rest of the world has much to offer us. JANET(UK) has been involved with TERENA, the Trans-European Research and Education Networking Association, for many years; Steve Hogger, our new International Relations Head, details other geographical areas in which we might become more involved internationally on page 3.

As networking technology develops it makes developing and enjoying its benefits in isolation ever more unthinkable, both in moral and straightforwardly practical terms. What affects one affects all.

A report on this issue on the most recent TERENA Networking Conference (page 11) indicates that discussion at the conference went off in an interesting direction, not so much taking a long term view of the networking industry as speculating that even the near future may be completely unforeseeable as exponential technological development shoots off the graph.

Running a successful network is not just a matter of having the equipment in place. It is also vital to have the right mindsets and the right expertise to hand so that whatever may come, we can handle it. It's said that the best special effects in a film are the ones you don't even notice; the best network development is handled so smoothly that our users may not even be aware of it.

We all face the future together, and JANET works hard to have everything in place for when the future arrives.

Ben Jeapes
Technical Editor
ben.jeapes@ja.net

JANET as an International Partner

JANET(UK) has recently appointed a new Head, International Relations. Steve Hogger took up the post in May of this year.

Some may remember Steve from his time in the Department of Education (now Children, Schools and Families) where he worked with JANET colleagues on a regular basis. This is a new post, which is intended to give JANET and the UK's education and research community a higher international profile and to better coordinate our international activity.

Steve said: 'I'm very happy to be working at JANET, which is an organisation I've greatly respected and enjoyed working with in the past, on the key area of international relations.

We are moving into a new era where greater international awareness and cooperation will become essential. Many individuals at JANET are already well respected in the international community for their knowledge and work in key areas of academic networking. I would like to build on this excellent reputation, and on the good international relations we have already developed, to help make JANET(UK) the leading member of this community.

Although there has been very good progress to date in several of our key research activities, there are many other areas where we might become more involved internationally. These include: collaborative learning projects (using JANET services), arts and humanities; and joint projects with countries outside Europe, especially the growing economies of Asia, India and South America.

I hope to fully involve a wide range of colleagues, both in JANET(UK) and in the wider academic community, and look forward to meeting and working with people involved in this area as this important work progresses.'

Steve Hogger
Head, International Relations
steve.hogger@ja.net

Online Course Support

Course support areas are now being rolled out on the EdLab learning and collaboration site, giving delegates registered on JANET Training courses access to course information, activities and materials from the course, online.

Pre-course areas contain details of what to expect from the day, along with pre-course resources that delegates may find of interest, helping to fill any gaps in prior knowledge required for the course. 'Meet the Trainer' provides a preparation letter from the course trainer, as well as developments and links they suggest may be of interest.

Following a course, delegates have access to course resources, activities, tests and useful links. They can look again at activities completed on the course and have another opportunity to complete simulations and other activities. A course discussion area and chat room are available, allowing delegates to continue classroom discussions and follow up any questions they may have with the trainer and other delegates. These course support areas started being rolled out at the start of June and it is hoped to have areas for all courses up and running over the summer.

Although these new areas are restricted to those who have booked on a face-to-face course, EdLab itself provides access to free online learning resources and collaboration tools in public areas. These areas are available to anyone from the JANET community but are particularly aimed at technical staff responsible for networking, IT security and videoconferencing.

To login or register for EdLab go to www.ja.net/training/edlab

JANET Training Team

Shaping the Future of Access Management in the Schools Sector

In recognition of the steady increase in membership in the past few months from organisations within the schools sector, the UK Access Management Federation and Becta have invited key individuals from identity providers and service providers to attend a meeting on 1 October 2008 to discuss specific issues facing organisations within this sector.

The meeting will identify the kinds of information required for access management decisions in the schools sector and plan how federated access management technologies, standards and policies can be used to improve the accuracy and privacy of those decisions and information transfers. It will also provide an opportunity for all those involved in federated access management in the schools sector to discuss future steps in establishing a framework of help, advice, best practice and guidance in this area.

This is an invitation-only event and numbers are limited; however, if you have not received an invitation and feel you would like to take part then please contact Frances Burton, Schools Co-ordinator: UK federation (frances.burton@ja.net; telephone 01235 822336), as we may still be able to accommodate you. Those who have received invitations are requested to return them as soon as possible.

Frances Burton
Schools Co-ordinator:
UK federation
frances.burton@ja.net

UK federation can be found at www.ukfederation.org.uk

JANET Talks!

The JANET Talk trial is now underway with over 100 JANET connected organisations taking part. Around 7000 users will be making use of JANET Talk over the coming months, taking advantage of the rich voice, video and collaboration tools available to connected sites. During the trial organisations will be able to hold virtual meetings, share and edit documents and diagrams, hold multi-point conferences and communicate with PSTN users.

The flexible nature of JANET Talk enables users to choose the communication tool which best suits them. This could be anything from a simple voice call to a multipoint conference with audio, video, shared whiteboard, application sharing, file sharing and text based chat.

Applications from organisations wishing to take part in the trial were received from all sectors of the JANET community, including HE, FE, schools, research organisations and service providers. As part of the trial, users were asked to describe how they proposed to use JANET Talk. This resulted in a very interesting range of usage applications being received; from distance learning, departmental meetings and the ability to collaborate with remote sites, to personal tuition, collaboration with international partners or simply keeping in touch.

JANET(UK) plans to use feedback received during the trial to help create a sustainable business case for JANET Talk in the future. The trial will also help to further understand how JANET Talk will play a role in the IT strategies of JANET-connected institutions over the coming years. As this is a trial, we have the opportunity to modify the types of collaboration tools provided by JANET Talk, to ensure that it meets the requirements of the community.

In the December issue of JANET News we are planning to include case studies showing how JANET Talk is being used.
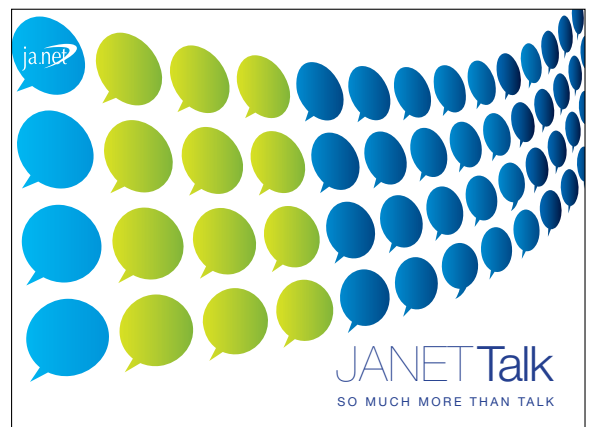
JANET(UK) has opened up participation for phase two of the trial. Any organisations interested in taking part can find more information on the JANET website or contact the author.

David Richardson
Internet Voice & Video: Team Member
david.richardson@ja.net

JANET Roaming and the *University of Sussex*

The latest JANET Roaming case study highlights how the University of Sussex has implemented FreeRADIUS v2.0 and the necessary infrastructure to participate in JANET Roaming. There is specific focus on the configuration of FreeRADIUS 2.0.

This new case study for JANET Roaming has been written by Arran Cudbard-Bell of the University of Sussex. It is very timely since the new version of FreeRADIUS was only released in January of this year. Since then there have been a number of bug fixing updates and now many organisations view the 2.0 version to be mature enough for deployment. This case study will be of particular interest to the 31 organisations participating in JANET Roaming that run FreeRADIUS 1.1.x RADIUS servers.

This very detailed case study shows how the University of Sussex has implemented FreeRADIUS 2.0.2 with an OpenLDAP user database together with the necessary network infrastructure to support the JANET Roaming eduroam service. There is particular emphasis on the configuration of FreeRADIUS and also in-depth coverage of the network infrastructure which is based on HP AP 530 wireless access points and Procurve 2600 switches.

Organisations looking to benefit from the JANET Roaming service must implement systems that are compliant with the Technical Specification. The University of Sussex achieved this by documenting and configurating scripts for EAP, realm handling, forwarding, attribute filtering, packet and database logging and log rotation. The configuration of the network infrastructure is also important, since it must be integrated with the RADIUS system in order to provide an effective and secure guest network. The case study also includes sections on the configuration of the HP AP 530 wireless access points and Procurve 2600 switches.

The JANET Roaming service now has 92 registered participants and activity has tripled over the last nine months. To find out how your organisation could benefit from the service and for further information see: **www.ja.net/roaming.**

For a downloadable copy of the Sussex FreeRADIUS case study please see: **http://www.ja.net/documents/services/janet-roaming/sussex-freeradius-case-study.pdf.**

Edward Wincott
JANET Roaming Service Manager
edward.wincott@ja.net

eduroam
JANET Roaming

Local Loop Unbundling Call Issued

On August 4th, JANET(UK) issued a call for expressions of interest in activities relating to local loop unbundling (LLU). LLU is the umbrella term for the processes involved in giving a third-party provider access to the cables in the ground between telephone exchanges and customer premises. The current project is aimed at exploring the potential for LLU in certain niche cases, such as providing low cost connectivity to smaller educational sites or implementing a diverse resiliency link for an existing connection.

Responses are sought from both regional operators (RNOS, RBCs, LEAs) and individual organisations. At the larger scale, JANET wishes to partner with a single region to conduct an in-depth survey of the distribution of current and future connectivity needs, with a view to identifying clusters of connectivity centred on a telephone exchange: the ideal situation for the economies of LLU to be realised. An individual organisation, preferably with LLU experience, is invited to participate by providing a detailed review of the technology, the impact of adding it to a site's portfolio of networking skills, and costed deployment scenarios.

Responses to the call are requested by 15th September.

To find out more please go to **http://www. ja.net/development/llu.**

Mark O'Leary
Technical Specialist : Network Access
mark.o'leary@ja.net

JANET Service Desk Extends Operating Hours

Since January 2007, the JANET Service Desk has been the single point of contact for enquiries regarding the JANET core network and all JANET services. Enquiries can be made by email to **service@ja.net** or by phone on **0870 850 2212.**

The JANET Service Desk also pro-actively monitors the network, resolving all faults and authorising maintenances. Enquiries regarding network issues can be made by email to **operations@ja.net** or by phone on **0870 850 2212**.

As of 1st October 2008, the Service Desk's staffed hours from Monday to Friday will be extended to 07:00 to 23:59 from the present 07:00 to 18:00. Any network enquiries outside of these hours should be made using the out of hours phone number.

Giovanni Sorenti
JANET Service Desk Manager
giovanni.sorenti@ja.net

Progress on Open Source Security Software

In December last year JANET(UK) joined forces with the OpenSEA Alliance to develop an open source IEEE 802.1x client. A new release of the client is now available. v2.1.3.342 is much easier to use and boasts features such as a configuration wizard, an 'at-a-glance' list of available Service Set Identifiers (SSIDs), and a quick connection option from the tray icon with both wireless and wired connection options. The supplicant, which aims to be the 'Firefox of supplicants', has been developed to assist institutions in managing secure access to their networks.

JANET's Role in OpenSEA

JANET(UK) has established its role within the project by setting up a test bed for supplicant releases to help shape development through a feedback mechanism. JANET(UK) currently has a member on the board of the OpenSEA Alliance and on the Project Management Committee. The University of Loughborough, as the lead site in the JANET project, provides lines of communication between the committee and project sites.

Since joining the OpenSEA alliance there have been a number of new investments including a subscription to MSDN (Microsoft Development Network) and membership of ADC (Apple Development Connection), plus purchase of new development servers. The Project Management Committee can now make imminent informed decisions and take corrective action by compiling code releases on a nightly basis. This allows the JANET supplicant testing team to receive faster turnaround from the feedback they provide.

The OpenSEA Supplicant Road Map

A report from the JANET community shows an increase in the number of student machines running Microsoft Vista. In addition, Microsoft has announced that as of 30th June 2008 Windows XP will no longer be available for sale. An adjustment in emphasis on the importance of a Vista compatible supplicant

has been highlighted. The OpenSEA Alliance has responded to the change as the current road map clearly indicates, with inclusion of support for Apple OS X (Tiger, & Leopard), Linux (Red Hat, Ubuntu & SuSE) and Vista. The Alliance is currently in talks with a number of potential developers in response to a Request for Proposals with an objective to accelerate development of the supplicant.

Louis Searchwell
Technical Specialist :
Authentication & Authorisation
louis.searchwell@ja.net

The Open1X Supplicant is currently under development - Anyone interested in testing the supplicant and providing feedback can download it from Sourceforge: http://sourceforge.net/project/showfiles.php?group_id=60236&pa

Both the OpenSEA Alliance and JANET(UK) would welcome any feedback on the Open1X Supplicant This should be sent to opensea-support@lboro.ac.uk. We are unable to provide direct support with using the supplicant but we would be grateful for any feedback on its functionality and usability.

The main discussion forum for the JANET supplicant project is the mailing list DOT1X@JISCMAIL.AC.UK. To join this list please use the following URL: http://www.jiscmail.ac.uk/cgi-bin/webadmin?SUBED1=dot1x&A=1. More information on the JANET Supplicant trial can be found at http://www.ja.net/development/middleware/802.1x-supplicant.html.

'at-a-glance' list of available SSIDs

Wireless and Wired Connection Options

Configuration Options

Moodle Mobile is a Hit

The MoodleMobile module for JANET txt, launched in June this year, has proved very popular across the community and has received an overwhelmingly positive response from across the range of Moodle users. MoodleMobile is an SMS integration module within the Moodle Virtual Learning Environment.

As ILT Technical Support Worker, Paul Warde is the technician responsible for installation/setup and staff training at Bury Adult Education Service. He says: 'From my point of view the plugin was easy to install and configure with no apparent post installation problems. Staff training is minimal as tutors are already familiar with the Moodle front end and the plugin integrates seamlessly, operating in much the same way as the Moodle Messaging module.'

Paul Taylor, Network and Corporate Data Manager at Gateway Sixth Form College, says:

'The new MoodleMobile module is a welcome service which we have embedded into the College Moodle site, and should give our teachers an opportunity to communicate more effectively with students on their courses. I have no hesitation in recommending JANET txt as a cost effective additional communication tool for colleges.'

JANET txt was specifically designed and procured for use by learning providers in the UK, and through aggregated community use the cost per message will come down as usage goes up. **www.pageonejanettxt.com**

Paul Wakefield
Account Manager – FE England & Wales
paul.wakefield@ja.net

From Moodle to Noodle

In response to user requests a new means of accessing the NLN Materials from within the Moodle virtual learning environment has been released by the service's developers, Xtensis Ltd.

The NLN Materials are a comprehensive collection of e-learning materials. The release of the service in October last year has been enthusiastically received and to date almost 10,000 new users have registered.

There are already a range of means by which NLN Materials can be used within Moodle, suiting local organisational requirements (see **http://www.nln.ac.uk/?p=Moodle**). Now Xtensis has created Noodle, an extension to Moodle that allows access to the NLN Materials without the need for a local repository, but also without the need for users to login separately to the NLN site. Instead, a cut-down version of the NLN site appears within Moodle, allowing users to add an NLN Learning Object, browse

NLN through a simplified version of the NLN site in a pop-up window, browse or search for a Learning Object in the usual way, and click the 'Add to Moodle course' button. With this last option the window closes and the selection is set, with the title and description of the resource automatically updated with those of the Learning Object.

More information, with updates on the project and a video of it in action, is available on Noodle's dedicated project page at **http://www.nln.ac.uk/?p=Noodle**.

The management of the NLN Materials service is provided by JANET(UK) in partnership with JISC and the service contract has been awarded to Xtensis Ltd, who have been involved in the NLN Materials programme since its inception and had successfully offered NLN Materials access to Adult Community Learning and offender learning providers prior to winning this contract. Support is available from local RSCs and a national help desk.

Paula Smith
Facilities & Content Service Manager
paula.smith@ja.net

University of Edinburgh becomes the first Scottish Early Adopter of the N3 JANET Gateway

The number of early adopters of the N3 JANET Gateway has now reached five, with the University of Edinburgh joining at the end of June. The aim of the Edinburgh early adopter is to improve access to the Medical School's Virtual Learning Environment and library services by students on clinical placement in NHS Lothian and elsewhere in Scotland. It will also help NHS based staff working with the University.

The major new feature of this early adopter is that it needed to be approved by NHS Scotland nationally, and particularly NHS Lothian locally, and there was strong support to proceed.

Meanwhile the Wellcome Trust Sanger Institute, an existing early adopter, has reported a good outcome so far for improving access from the 18 centres in the NHS to their DECIPHER web-based tool for clinical practice and clinical research: 'With the advent of the N3 JANET Gateway for DECIPHER all the issues of accessing the DECIPHER website are addressed. Clinical Geneticists and Cytogeneticists can now add and access their records at a satisfactory speed allowing them to use this essential diagnostic and research tool in clinical practice,' says Dr Paul Bevan, Sanger Institute Webteam Leader. DECIPHER is a database of sub-microscopic chromosomal imbalances, collecting clinical information about chromosomal micro-deletions, duplications, insertions, translocations and inversions and displaying this information on the human genome map.

Early Adopter N3 JANET Gateway to Continue

Bob Day, Chief Technology Officer at JANET(UK), announced to the NHS-HE Forum on 14 May 2008 that the early adopter N3 JANET Gateway will continue for at least a further year after the initial one year contract, which ends in October. This will give further time for gaining other early adopter experience, especially early adopters where the sessions are initiated in JANET. It also gives longer for the creation of the joint business case with NHS Connecting for Health for a long term solution that is resilient and responsive.

NHS HE Forum News

The latest and fourteenth NHS-HE Forum took place on 14 May in London and the presentations are available at http://www.nhs-he.org.uk/14-may-2008.html. One of the highlights was hearing Professor Sir Alex Markham explain NHS Connecting for Health's Research Capability Programme which aims to provide tools to allow improved access to the NHS data for clinical research purposes, in support of Best Research for Best Health. Ian McKinnell from the National Library for Health in England also explained how he plans to consider the use of UK Access Management Federation and SAML-based access management during the lifetime of their current contract for Athens.

At the end of the Forum, Ted Woodhouse, on behalf of everyone involved, formally thanked Professor Roland Rosner for all his contribution so far to the NHS-HE Forum as instigator and then chair of the Forum since 2001. Roland retires at the end of September from UCL, and we wish him a very happy future and huge thanks for all he has done for the improved interface between the NHS and Education and Research.

Malcolm Teague
NHS-HE Coordinator
malcolm.teague@ja.net

As JANET Collaborate welcomes its 1,000th Member, the site continues to go from strength to strength

Last week a teacher at Gwinear Community Primary School became the 1,000th member of JANET Collaborate, adding to the rapidly growing number of schools and content providers to take advantage of the opportunities available to its members.

To date, JANET Collaborate has been used by a wide range of schools to enhance curriculum delivery. One of the main attractions of the site is the facility to find educational videoconferencing content from Museums and other providers in order to bring learning alive by enhancing the student experience.

'I think JANET Collaborate is really fantastic. Getting the message out there to lots more schools and teachers is the next step' says Sarah Whittle, Educational Programme Developer at The Natural History Museum. 'I think it's great that JANET Collaborate is free to access for all teachers because we need to make sure that as wide a membership as possible can access our videoconference opportunities,' Sarah adds.

"I think JANET Collaborate is really fantastic. Getting the message out there to lots more schools and teachers is the next step"

'I used it to find opportunities offered by content providers, kind of like an online directory,' says Gary Limb, Primary Teaching and Learning Consultant – ICT, Wigan Metropolitan Borough Council. 'The teachers seem to like the site. They like the look and feel of it. It's easy to use and friendly. It has helped to launch videoconferencing a lot more effectively in Wigan. One of the things coming back from schools was that videoconferencing is good and there is a lot of potential but where and how do I find things and what do I do with it? But now, having a site like JANET Collaborate, offers a one-stop-shop.'

The now completed pilot stage (in which JANET(UK) issued a survey to members, collected case studies and commissioned an independent usability study) has produced a detailed picture of how the prototype has been used by the enthusiastic and expanding membership. Conclusions from the pilot report and feedback from the users will contribute to specifications for potential Phase 2 developments of the prototype service. Some suggestions for future developments include using the site for training and networking activities, strengthening

"It allows me to just focus on what we're going to do in the videoconference instead of spending lots of time finding a partner"

international partnerships, adding new features such as email alerts and developing more fine grained search facilities.

JANET Collaborate was also used to launch a Videoconference partnering programme earlier this year. The aim of VC Partners is to help schools find similar groups to collaborate with; it has been a great success so far. 'I got an email back from a teacher who had joined a VC partner opportunity saying thanks and that they had received a partner in just 20 minutes!' said Iain Midgely, Broadband Services Consultant at CLEO (Cumbria and Lancashire Education Online).

The importance of such resources as JANET Collaborate is summed up in the words of Leanne Swallwell, IT Teacher at Dyke House Secondary School in Hartlepool: 'It allows me to just focus on what we're going to do in the videoconference instead of spending lots of time finding a partner.'

The JANET Collaborate site is going from strength to strength with the number of members growing rapidly. Looking to the future, Iain Midgely comments 'The more schools that get involved and the more opportunities posted there, the more use it will be to schools.'

Tim Boundy
Schools Content Co-ordinator
tim.boundy@ja.net

It's the end of the *data networking* world as we know it…

"Sometimes I've believed as many as six impossible things before breakfast." - Alice in Wonderland, Lewis Carroll

Something rather strange happened at TERENA's TNC 2008 conference. Rather than giving us a long term view of the networking industry amounting to 'more of the same', or even 'faster and cheaper', a number of the plenary speakers introduced a concept more usually the domain of futurists and philosophers, namely 'the technological singularity'. They sought to persuade us that in a very real sense all bets are off and it is impossible to tell what data networking or even the university as an institution will look like beyond the next decade or so. So what is this 'singularity', and why does it make the future so uncertain? The core idea behind it is a simple one: that the rate of advancement of technology follows an exponential curve. Put another way, the more knowledge that has accumulated to date, the faster future progress is achieved. This has been referred to as the Law of Accelerating Returns.

The trouble is that exponential growth is hard to spot from our perspective: our minds are biased towards extrapolating linear trends. A commonly-cited illustration of this is the tale of the inventor of chess and his patron. Offered any reward for the new game, the inventor asks for a single grain of rice on the first square of the board, two on the second square, four on the third, and so on. The patron is bankrupted trying to meet this seemingly-modest request as the 63 doublings would ultimately require a total of 18 million trillion grains of rice, the production of which in a single season would require rice fields covering twice the surface area of the Earth, oceans included[1]. Many of us (who hadn't already heard the story at least) might have fallen into the same trap. What might be more surprising to us is that the patron probably wasn't too worried as the initial distribution

went on: even after completing the first half of the board he'd have counted out little more than the harvest of a single field. But it is characteristic of exponential growth that it appears to us to suddenly explode into vast numbers from slow, small beginnings.

A rupture in the fabric of human history

This is where the technological singularity comes in. A number of futurists believe that our technological progress in a number of key areas is just starting to reach the 'second half of the chess board', the point where from our perspective past, near-imperceptible increases in the rate of progress suddenly become large enough to demand our attention. The relatively slow accumulation of knowledge in the past is set to accelerate beyond our ability to imagine. As the steepness of an exponential curve increases, the rate of change accelerates, until ultimately the curve goes (almost) vertical – implying a near-infinite rate of technological advancement, well beyond human limitations. Singularity proponents go so far as to imagine that post-human or machine intelligences will arise and devote some of their attention to making themselves continually smarter and faster to keep up with this explosion of technology, ushering in a 'technotopia'.

Some well-respected figures find the singularity argument compelling. Raymond Kurzweil, futurist and inventor, asserts that the technology curve will go vertical some time in the 2020s, causing 'technological change so rapid and profound it represents a rupture in the fabric of human history'. Professor Vernor Vinge places the singularity in the 2030s. That near-magical technologies might be so close seems unlikely to us at first glance, but the mathematics is sound if the underlying assumptions are true. If any given futuristic

Number of hosts
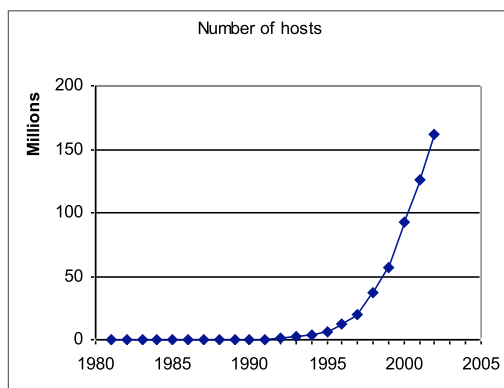
1. From a linear viewpoint, the growth of the Internet appears to undergo a sudden explosion in the 1990s.

Number of hosts (logarithmic)
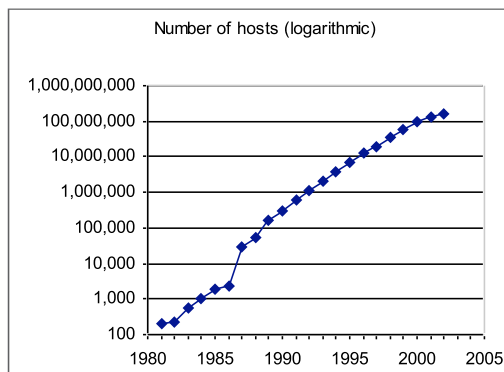
2. View the same data against an exponential scale, and it is seen to be an entirely predictable result of a trend stretching back to the 1970s (data from Internet Software Consortium (ISC) Domain Survey: Number of Internet Hosts, http://www.isc.org)

technology is estimated to require 100 years of technological progress to achieve at today's rate of progress, a doubling of the rate of progress every decade – as observed so far across numerous technologies and exceeded by some – would see us achieve that century-worth of technological progress in only 25 calendar years. Kurzweil maintains that even the rate at which the progress rate is accelerating is itself subject to a measurable exponential increase. He states that 'technological progress in the twenty-first century will be equivalent to what would require (in the linear view) on the order of 200 centuries.' This then is the singularity, the point beyond which our abilities to predict fail; an event horizon for the futurist and network planner alike[2].

But how might these forecasts affect us in data networking provision and education? Richard Allan of Cisco cited data rate projections when addressing the Broadband Stakeholder Group this summer. He was illustrating just how quickly our current DSL-based broadband world will be superseded by fibre to the home, but the wider implication of these figures is of 100-fold increase in access rates in the next decade or so – will some future JANET7 network (granddaughter of SuperJANET5) be running a 10Tbit/s core? Will our campuses offer 10Gbit/s to the desktop?

We had better hope so: Internet traffic is increasing a thousand-fold every five years. The Internet presence of an educational organisation today is addressing only 0.1% of the Internet's potential volume five years hence. We are familiar with Moore's Law, the doubling of computing power every 18 months, but less well known is that bandwidth growth is roughly tracking a similar pattern: it is doubling every six months. A single cable can now carry a thousand times more data than the average total traffic on the global communications infrastructure of five years ago.

## Into Alice's mirror world

So what did the experts at TNC2008 suggest our reaction to the coming singularity might be, in terms of network provision and planning at least?

Tim Robinson (Network North West) highlighted accelerating technological change as a key factor in the future direction of our industry, but was optimistic that teaching and learning will ultimately remain a human-to-human interaction in some form. However, he noted that the half-life of any given skill we might learn will get shorter as these changes accelerate. The key skill will therefore be the ability to learn, and in his vision (his presentation was initially to be given by Professor Mark Clark) the 2020s will see the rise of the virtual university, an online experience indistinguishable from the real world. More immediately, the challenges we in networking face are users with more computing power at home than an institutional refresh cycle can compete with, and existing relationships with networked service providers that they will be unwilling to abandon to adopt institution-provided, -branded and -regulated alternatives. Campus ICT provision must adapt to these new users, and lower cost shared services or even the open market may be the way to go.

Richard Katz, vice president of Educause, also quoted Kurzweil: 'exponential growth looks like nothing is happening, until it explodes.' In his presentation, he suggested that our existing focus on serving layers 1 to 7 of the OSI network model well must be modified to included new layers 8 to 10: human psychology, the economy and society as a whole. Efficient networks are not enough – they don't guarantee us student engagement, democracy

Trend for Access Bitrates: Exponential Growth

Source: Heavy Reading report "FTTH Worldwide Market & Technology Forecast, 2006-20011"
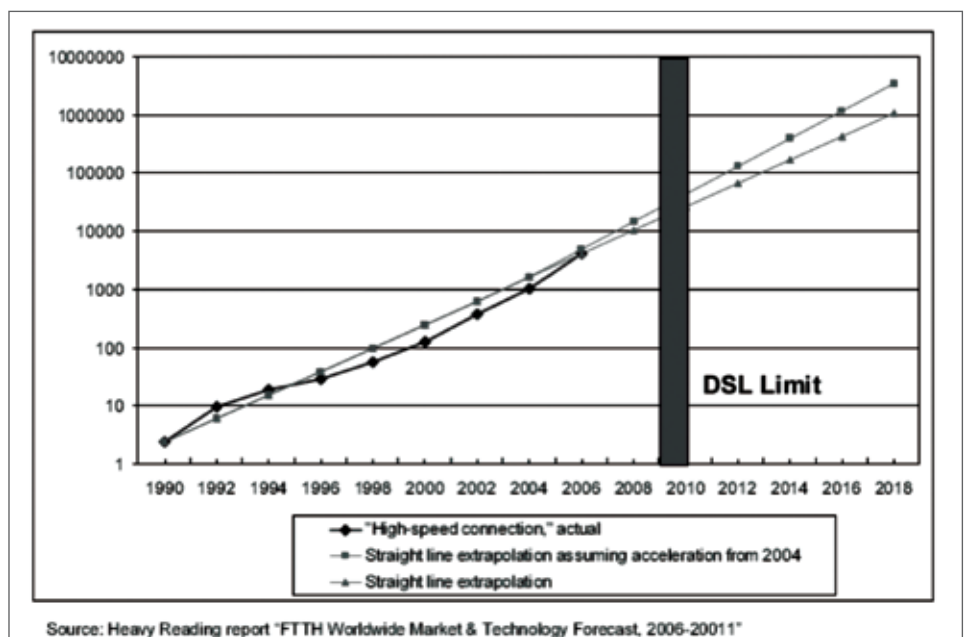
of access, or good teaching (although they are increasingly vital to good research). We need to clarify the idea of the university and define how such institutions can influence world affairs. As he said in closing:

'IT has gotten better. So good in fact, it allows us to change things. Profoundly. IT allows others to change things as well, making our task more urgent and more complex. In the next decade, the modern university is likely to be less a place than an idea instantiated in architecture – real and virtual. Our challenge is less technical and more one of institutional purpose, adaptability and will. The needs of our stakeholders are changing. Soon virtual environments to support learning and discovery will rival and surpass ''built'' ones, in certain cases. The successful university of the future will know its values, have clarity of purpose, and an IT capacity to reflect and extend those values and purposes globally.'

Finally, Josh Howlett of JANET(UK) extended an idea of Douglas Adams' to illustrate where we may be in terms of changing technology. Adams proposed four 'Ages of Sand' as emblematic of technological change: from the glass ground into telescope lenses (leading to the Newtonian view of a clockwork Universe) and then microscopes (which gave us a glimpse of the complexity of life) during the Renaissance, to the silicon chips of the computing age (which allowed us to perform calculations fast enough to start to model some of the processes around us), and finally the glass fibres of our current high speed data communications (that gave us the Internet). Josh suggests we may now be entering a fifth Age of Sand: through the looking glass into Alice's mirror world where technology and magic blend and nothing is as it seems …

Future Imperfect

Where does this leave us? Does our ability to plan ahead really hit some kind of brick wall in the next decade or so? It is an intriguing prospect, but we should remember that mathematically-inspired oracles have a chequered history. Perhaps the last word should go to a futurologist of the past:

'The speed trend curve alone predicts that manned vehicles will be able to achieve near-infinite speeds by 1982 […] By 1981, this trend curve shows that a single man will have available under his control the amount of energy equivalent to that generated by the entire sun.'

- G. Harry Stine, 'Science Fiction Is Too Conservative', Analog, May 1961

Mark O'Leary
Technical Specialist : Network Access
mark.o'leary@ja.net

The TNC Plenary presentations are available at **http://tnc2008. terena.org/schedule/index. php?showday=2008-05-19**

The technological singularity is discussed in more detail at **http:// www.kurzweilai.net/**

Douglas Adams' Four Ages of Sand essay is at **http://www.douglasadams. se/stuff/sand.html**

1. Another version has the chess inventor beheaded instead.

2. There are of course those who dispute either the timetable or the possibility of singularity at all: for example, Penrose and Searle dispute the possibility of machine consciousness; Dennet and Brooks doubt that the exponential curve can accurately be extended into the foreseeable future. There's a lively debate between the camps (explored, for example, in the June 2008 edition of the IEEE's Spectrum magazine) and we won't rehash it here.
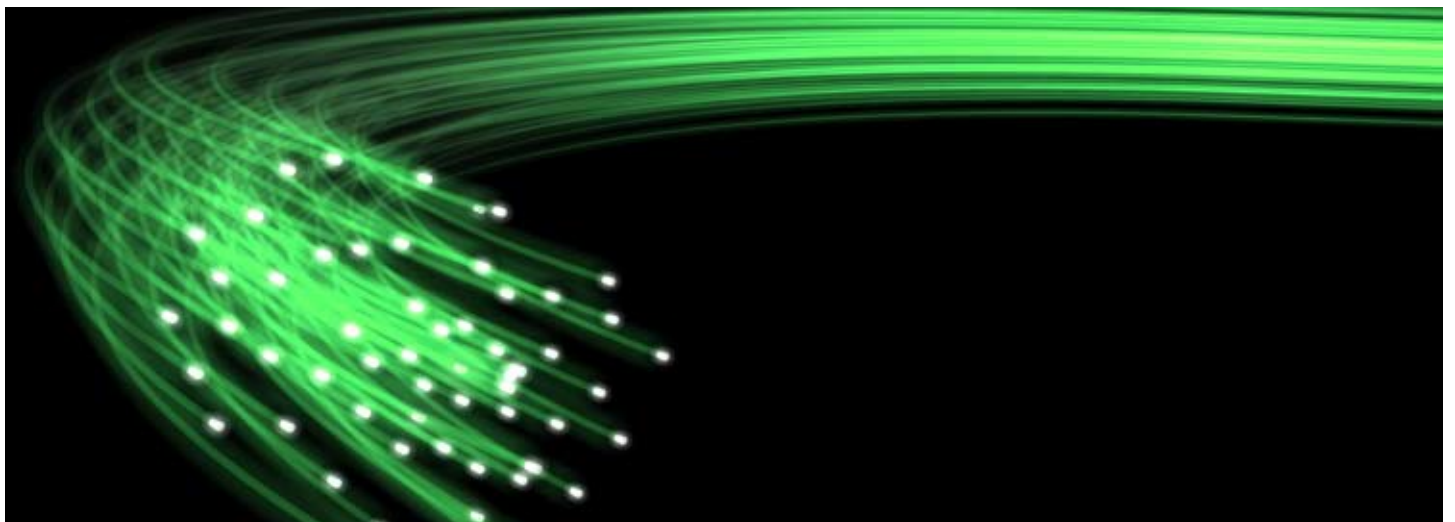
JANET IPv6 Briefing

JANET(UK) held an IPv6 Briefing event at the Lakeside Centre, Aston University in Birmingham on 11th June. This event was aimed at managers within the JANET community who are responsible for authorising and planning the deployment of network services on their organisation's infrastructure.

A range of presentations were given to provide an insight into the state of IPv6 both within and outside JANET, and guidance on how to cope within a mixed IPv4/IPv6 environment. Case studies were also presented on the planning and deployment of native IPv6 unicast and multicast services on a site and regional network.

Over 50 delegates attended the event and positive feedback was received. The presentations from the event can be found at: **http://www.ja.net/services/events/2008/ipv6/programme.html**

Rina Samani
Network Development Group Manager
rina.samani@ja.net

An IPv6 Management Briefing Document is available at **http://www.ja.net/development/network-engineering/ipv6/**
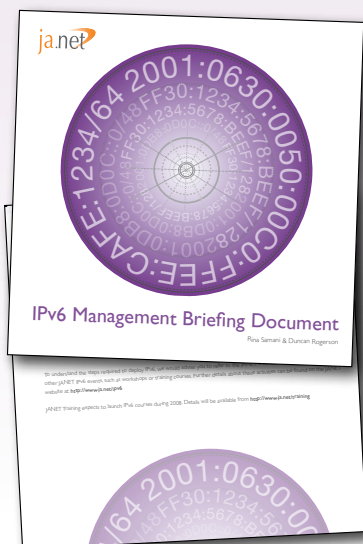
JANET Briefing Day – *16th June 2008*

The JANET Briefing event was held at the Royal College of Physicians in London. The day consisted of a variety of speakers from both the community and the commercial sector.

Nick Shacklock from Becta began the event by explaining the challenges of delivering universal home access for parents and students. John Paschould followed by discussing the management of identity and the provision of access to everything. Both the morning's speakers raised a number of questions from the audience.

Two talks on IPTV over JANET followed lunch. Gary Parker from Loughborough University described the recent use of IPTV over JANET to deliver a university rugby match to a wide audience. Simon Mulholland then described the experience of using IPTV at the University of Leeds.

The day finished with a talk on HP and the environment by Bruno Zago from HP and Chris Gabriel from Logicalis.

Feedback from the audience on the variety of subjects covered during the day was positive and they were keen to suggest subjects for future one day events.

Shirley Wood
Head of Communications and Support:
shirley.wood@ja.net

Forthcoming Event

IPTV Briefing Event – *6th November 2008*

After the success of last year's event, JANET(UK) is holding an IPTV Briefing Event at The Møller Centre, Cambridge on 6th November 2008. The event will include an array of presentations focused on IPTV and its uses within and outside the community. The presentations will include insight into the deployment of IPTV and differing video formats such as ultra high definition.

This event is aimed at all those within the JANET community who would be interested in IPTV and content delivery.

The event will start at 10.30 with registration and refreshments and the formal sessions will commence at 11.00. It will finish no later than 15.45.

There is no fee to attend this event but you must book your place using the online booking form which can be found linked from the following web page:

http://www.ja.net/services/events/2008/iptv/index.html

Programme

10.30 - 11.00	Registration and refreshments
11.00 - 11.30	Welcome and JANET update
11.30 - 12.00	Commercial Presentation
12.00 - 12.10	Q and A session
12.10 - 13.10	Buffet lunch
13.10 - 13.40	Pre and Post Production of IPTV
13.40 - 14.10	Ultra High Definition
14.10 - 14.20	Q and A session
14.20 - 14.30	Refreshment break
14.30 - 15.00	Peer to Peer Applications
15.00 - 15.30	Radio over the Internet
15.30 - 15.45	Q and A session
15.45	Close

(Please note programme is subject to change)

Forthcoming Exhibitions: BETT Show 2009

Come and see the JANET stand (J50) at the BETT Show, 14th-17th January 2009 at Olympia, London. The main focus of the stand will be making use of the JANET Videoconferencing Service to access resources such as live link-ups with museums. For more information on the BETT Show, please visit www.bettshow.com

Forthcoming Courses

OCTOBER

Introduction to Videoconferencing	**October 6th 2008 - Edinburgh**
Technical support of Videoconferencing	**October 7th 2008 - Edinburgh**
Implementing Shibboleth at your Organisation	**October 9th 2008 - Abergavenny**
Introduction to JANET	**October 16th 2008 - Cambridge**
Managing IT Security	**October 17th 2008 - Cambridge**
Using Logfiles for Security	**October 21st 2008 - Abergavenny**
Introduction to DNS	**October 22nd 2008 - Abergavenny**
Basic Router Configuration	**October 29th 2008 - Manchester**
Wireless LAN Fundamentals	**October 30th 2008 - Birmingham**

NOVEMBER

Information Security Policies	**November 19th 2008 - Glasgow**
Implementing Shibboleth at your Organisation	**November 27th 2008 - Manchester**

DECEMBER

Basic Networking	**December 3rd 2008 - Newcastle**
IP Fundamentals	**December 4th 2008 - Newcastle**

Dates and online booking for all courses are available on our website.

A mailing list is available for the distribution of information regarding JANET training courses. Discussion of training requirements relating to the JANET network, suggestions for new courses, locations or course frequencies are also welcomed. To join this list, access the JISCmail site at: **http://www.jiscmail.ac.uk/lists/janet-training.html**

Forthcoming Events

Networking Strategy Dinner and Workshop
Evening 3rd December and daytime 4th December 2008
Aston Business School

JANET IPTV Briefing
6th November 2008
The Møller Centre,
Storey's Way,
Cambridge
CB3 0DE

Moving Towards Implementation –
UK Access Management Federation
28th October 2008
Weetwood Hall Conference Centre & Hotel,
Otley Road,
Leeds,
LS16 5PS

JANET CSIRT Conference
23rd October 2008
Holywell Park Campus,
Loughborough University,
Loughborough,
Leicestershire
LE11 3TU

Networkshop 37
31st March – 2nd April 2009
The University of Cambridge

Events Calendar

http://www.ja.net/services /events/calendar-2008.html

Reports

Quarterly Report to the Community (February-April 2008)
http://www.ja.net/services/publications/reports/
quarterly-report/qr-spring08

Newsletters

JANET News 4
http://www.ja.net/documents/publications/
news/news-4.pdf

Technical Documentation

QoS on JANET technical guide
026(05/08)
http://www.ja.net/documents/publications/
technical-guides/qos-tg.pdf

Service Documentation

JANET Services
021(07/08)
http://www.ja.net/documents/publications/
general-information/janet-services.pdf

How to contact JANET(UK)

JANET(UK)
Lumen House
Library Avenue
Harwell Science & Innovation Campus
DIDCOT
Oxfordshire
OX11 0SG

Tel: +44(0) 1235 822 200
Fax: +44(0) 1235 822 399

JANET Service Desk

Tel: 0870 850 2212
Fax: 0870 850 2213
E-mail: service@ja.net

JANET CSIRT

Tel: 0870 850 2340
Fax: 0870 850 2341
E-mail: irt@csirt.ja.net

To be added to or removed from the mailing list for JANET News, e-mail

janet-news@ja.net

or use the JANET(UK) contact information above.

JANET(UK) manages the operation and development of JANET, the United Kingdom's education and research network, on behalf of the combined UK Higher and Further Education Funding Councils represented by JISC (Joint Information Systems Committee).

Availability

Further copies of this document may be obtained from the JANET Service Desk at the address on the left. This document is also available electronically from: **http://www.ja.net/services/publications/janet-news/**

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