The National Education Network

Delivering Personalised Learning

NEN Strategy Paper

The National Education Network

Delivering Personalised Learning

NEN Strategy Paper

Summary

Every Child Matters focuses on giving each child the support they require. The emerging emphasis on personalised learning is closely tied with ECM outcomes and is a rapidly developing central educational theme. The 'personalised learning space' and many management processes depend on the broadband networks that Local Authorities have been very successfully installing and operating.

Educational demand on these IT networks is increasing rapidly, sometimes doubling in a year. However a number of threats, not least from infrastructure price rises, have been identified that could restrict further development. Strong management action will be required to keep educational strategies such as personalised learning on course.

This National Education Network Strategy Paper is a result of discussions between the broadband agencies in Scotland, Wales, Northern Ireland and the ten Regional Broadband Consortia representing Local Authorities in England.

Becta and JANET (UK) are thanked for their help in writing this leaflet.

The National Education Network

Delivering Personalised Learning

NEN Strategy Paper

Executive Summary

Schools' use of the National Education Network (NEN) and Internet access continues to increase rapidly as the benefits of fast, reliable and safe connectivity enable learning styles to develop. The DfES broadband targets of 2 Mbps for primary and 10 Mbps for secondary have been pivotal in focussing attention on connectivity and the response by Regional Broadband Consortia (RBCs), Local Authorities (LA) and Regional Administrations has been magnificent.

However the requirements of schools with progressive ICT usage are overtaking these targets and they need updating to remain aspirational. Furthermore the excellent work in designing high-capacity and best-value networks has been put in danger by recent BT Openreach price increases and lack of certainty as to future BT product lifetimes and pricing structures.

In short there is an urgent need to ensure that all parties appreciate and accept the requirement to further develop the broadband infrastructure and that this will require political will, continued funding and good communication of benefits. Otherwise there is a distinct possibility that, if future connectivity decisions are made at institutional level based on cost alone, the overall broadband strategy could fragment and the benefits of a nationally coordinated approach would be lost as a result.

Action is now required to:

1) inform local and central government of the urgent need to continue infrastructure development, to challenge any assumption of "Job Done";

2) raise awareness of the risks to the delivery of educational strategy of increasing costs and the lack of information for medium-term planning;

3) ensure all RBCs and Local Authorities are aware of the effects of BT product and price restructuring and the need to check contracts and network design;

4) market to schools the educational benefits of the National Educational Network and its role in providing safe and secure access and in enabling personalised learning;

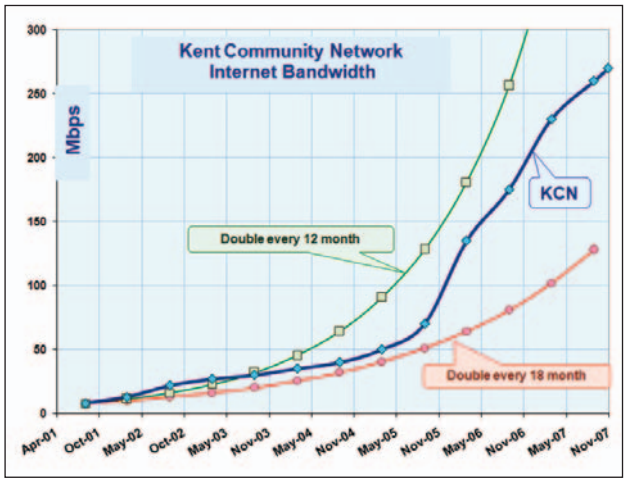
5) develop "intelligent and mature clients" who will be able to understand the benefits and full costs associated with integrated broadband delivery.

Purpose of this paper

This document describes how broadband connectivity and the further development of the National Education Network are fundamental to the successful delivery of education policy throughout the UK. Personalised learning is but one educational strategy that depends on fast, safe and reliable broadband connectivity.

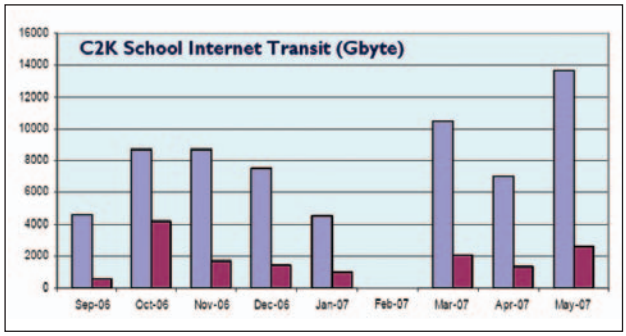
It is clear that schools are making considerable demands on their broadband facilities and usage is increasing rapidly. Schools' broadband services must increase in capacity to avoid restricting curriculum transformation. Educational developments such as personalisation and e-portfolios, with projects like Building Schools for the Future (BSF), Glow and C2K can only accelerate this requirement.

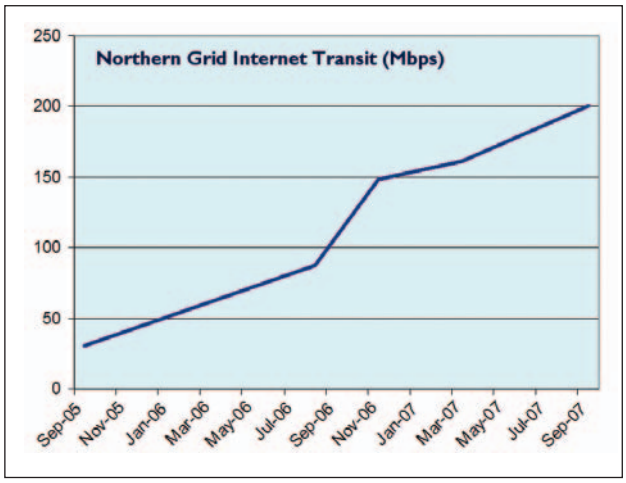
Growth of Internet Demand



This growth in Kent is typical of many RBC and local authority networks – demand doubling in less than 18 months over the last six years.

Some of the bandwidth growth is due to connecting more schools, but the big surge in recent years occurred after most secondary schools had been connected.





The charts from Northern Ireland and the Northern Grid above show similar trends in the growth of Internet transit bandwidth and data transfer for schools.

This document also assesses the impact of recent BT Openreach pricing and product restructuring for DCSF, Becta, Ofcom, Regional Broadband Consortia (RBCs), local authorities and suppliers throughout the UK. The potential effects and impacts of these changes on the development of the National Education Network are discussed, in particular, the impact on future costs and the consequential difficulties in planning wide area broadband networks to obtain best value in the absence of firm information from BT (as the major infrastructure provider) regarding product developments, life cycles and price changes. Lead times in wide area network development are typically 2 to 3 years and procurement cycles are often even longer, necessitating certainty in product pricing and availability if planning is to be effective.

This document is intended to stimulate further discussion and raise awareness of the value of the National Education Network and the potential threat to policy delivery posed by BT's recent announcements. It does not provide the full detail of the local impacts of BT's changes. Becta is currently undertaking a more comprehensive review to investigate the full impact on broadband policy, costs and network design at regional and local authority level

The information quoted in this document is based on the price increases announced by BT Openreach and usage figures that are held at RBC level, by Becta and by Learning and Teaching Scotland.

Broadband connectivity: at the heart of education policy

Broadband connectivity is fundamental to the Government's educational reforms and the children's services agendas for personalising learning and improving outcomes for children and young people.

Published in March 2005, *Harnessing Technology: Transforming Learning and Children's Services*[1] sets out the Government's e-strategy: a joined-up approach to utilising technology across the education system, enabling schools, colleges, universities and adult and community learning organisations to tailor education around the particular needs of their learners.

The e-strategy sets out a vision for a common digital infrastructure as an integrated teaching, research and administrative network for education. This infrastructure will provide common systems for electronic learning, administration and business. The e-strategy also sets out a vision for e-portfolios as personal online learning spaces to store coursework, course resources, results and achievements. Broadband connectivity, enabling online access from a range of locations, is a prerequisite for the effective delivery of e-portfolios:

"A personal online learning space: where you can store electronically everything related to your learning and achievements, course resources, assignments, research, and where you can plan your next steps, and build links for professional advice and support. And being online, it will be accessible from home, from school, and, in the longer term, from each new organisation as you progress."

Published in December 2006, *2020 Vision: Report of the Teaching and Learning in 2020 Review Group*[2] sets out a detailed vision for personalising teaching and learning. Broadband connectivity is central to the delivery of this. The report describes a wide range of ways in which broadband connectivity and new technologies can support personalisation, including:

- broadening the range of learning materials children are able to access, either guided by a teacher or as part of self-directed learning;
- promoting development of a broad range of knowledge, skills and understanding, in new contexts and with virtual access to experts;
- facilitating collaboration with peers (in the same school and in other schools);
- increasing the variety of learning resources, software and communication tools, through new media;
- helping schools to use a wider range of readily available resources and software to enhance learning, including making software available to children to use at home;
- blurring distinctions between informal and formal learning – giving children the ability to choose what they learn and when they learn it.

As well as extending opportunities and personalising education for learners, an integrated, national approach to broadband provision both UK wide and within each of the devolved administrations and across England also helps to ensure that children and young people are safeguarded as fully as possible. It also ensures delivery to nationally agreed standards which are the only sure route to interoperability. Such an approach improves co-ordination and data sharing between services and provides opportunities for new ways for everyone to access children's services. From the e-strategy:

"Technology can also help to provide more effective support mechanisms. The Green Paper Every Child Matters focussed on the importance of intervening early so that no child falls through the net. Technology can enable practitioners working with children, young people, families, and adults, to intervene earlier and provide a better service, supported by improved systems."

Making a safe online environment available to all educational establishments as a basic entitlement for all learners and teachers is fundamental to the development of broadband connectivity for schools. Such safe environments necessitate a combination of technical strategies and effective practice, underpinned by an agreed national framework of minimum standards, policies, procedures and accreditations to ensure provision of a consistent level of e-safety across the country.

A co-ordinated, country-wide (i.e. England, Wales, Scotland and Northern Ireland) approach to e-safety means that schools are not solely responsible for internet safety and security. School-level safety and security systems require considerable management to maintain effectiveness and place huge responsibility on the school if they are working in isolation. Schools that employ such systems but also recognise and adhere to national e-safety policy advice and guidance, and that are encompassed by

1 http://www.dfes.gov.uk/publications/e-strategy/
2 http://www.teachernet.gov.uk/educationoverview/briefing/ strategyarchive/whitepaper2005/teachingandlearning2020

in-depth security strategies from RBC networks with suitably trained school staff, can be sure their internet services meet or exceed national minimum standards for safety and security.

Thus a combination of national and regional strategy, in combination with effectively deployed and managed school-level systems, ensures that all reasonable steps are taken to ensure the safety and security of learners and teachers.

An integrated, nationally coordinated approach to broadband provision underpins many other areas of education policy too. For example under the Building Schools for the Future (BSF) programme, schools are encouraged to operate as clusters/federations supported by single ICT infrastructures. Similarly, the 14-19 agenda requires learners to be educated across multiple sites and across local authority boundaries in some instances. The Scottish Government is currently deploying the Glow project which will provide a Scotland-wide intranet featuring a portfolio of tools and application to provide opportunities for teaching and learning and collaboration in a secure and authenticated environment.

The National Education Network

The National Education Network is a powerful educational vision with many levels of structure and outcome. It can be seen as:

- a community
- a way of working
- a set of services
- a set of agreed standards
- a supporting infrastructure

The National Education Network comprises a UK wide core of interconnecting regional and country wide networks. These regional networks have been developed in various ways by the devolved administrations, Regional Broadband Consortia (RBCs) and English local authorities to provide broadband connectivity, in line with the goal that all schools should have a broadband connection appropriate to their circumstances and needs by 2006. There have been great successes in achieving this goal. As of December 2006, broadband connectivity was available to over 99% of all primary and secondary schools in England. In addition, connectivity in many areas had significantly exceeded the typical target connection bandwidth recommended by DfES. A large scale government ICT project had delivered on time, within budget and to a higher specification than originally set.

However it should also be acknowledged that some schools have been connected using ADSL circuits. Such circuits have limitations in comparison with full symmetric broadband circuits – particularly where demanding interactive multimedia applications such as desktop video conferencing are to be deployed. In Scotland, recent analysis confirmed that 49% of schools are connected by means of circuits which are 2Mbps or less. Many of these circuits were provided as products specially configured and priced for the education market including Learning Stream and Schools Internet Caller tariff which are now reaching end of life or extinct. It is essential that the development of WAN infrastructures continues to keep pace with maturing educational requirements for broadband capacity and facilities.

The nature of provision: diversity of approach, commonality of input

The need to reflect local circumstances and requirements necessitates a variety of approaches to the provision of connectivity across and throughout the UK at country, regional and local authority levels. As a result connectivity technologies, procurement, contractual and management arrangements vary considerably. This has often resulted in innovative approaches that have enabled delivery and reduced costs substantially, particularly where aggregation between sectors has been achieved.

In addition, the role of the regional network providers (including RBCs and the devolved administration providers) – in terms of management and administrative functions – also varies significantly. Some have a highly centralised function, managing relationships with service providers and system integrators to deliver core regional/country wide connectivity and connections right down to the school level. Others perform a coordinating role, developing and managing procurement routes (typically via the letting of framework agreements) for individual member authorities to purchase through. Others lie somewhere between these two approaches, in that they procure and manage a central core network and associated services while also letting framework agreements to support member authorities in the implementation of local

WAN infrastructure, services and connections to the regional core network. A helpful overview of the different RBC approaches and strategies is available in SEGfL's *Broadband Best Value* paper[3].

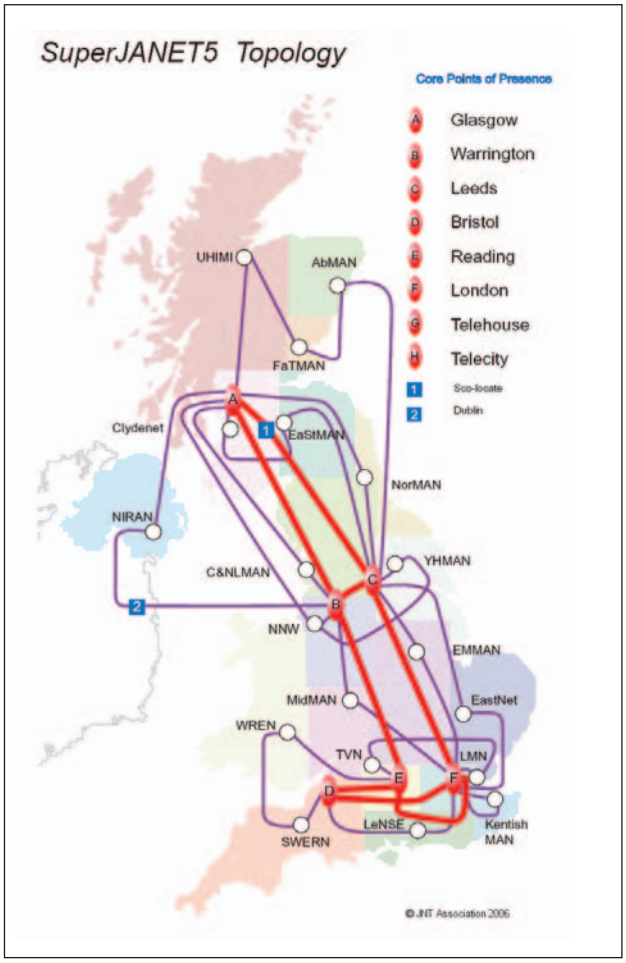
A common factor across the majority of deployments across the country is the heavy reliance upon a single supplier's infrastructure. BT Openreach's Ethernet portfolio is widely employed to build regional core network infrastructure and is one of the technologies used to provide many last-mile links to schools. This portfolio has provided very reliable, high-capacity and scaleable delivery systems which are essential in building teacher confidence. These important attributes enable learning to take centre stage, as once installed the capacity of circuits can be increased without re-installation, and network suppliers can concentrate on improving services, rather than repairing unreliable circuits.

In some areas Local Loop Unbundled (LLU) circuits are being used for last-mile connectivity. LLU uses copper pairs and with recent advances in equipment can provide useful bandwidth at lower cost than fibre, although over shorter distances. With rising prices for fibre, LLU may become more important, providing we have reasonable certainty of prices and product lifetimes.

Realising the full potential of the network: future development opportunities

RBC and local authority networks have grown dynamically since their inception to accommodate requirements for new services and provide the bandwidth upgrades needed to deliver them. The RBC Interconnect and the devolved administrations' country wide infrastructure (including the SSDN Interconnect, the C2K network and the Welsh Learning network) all utilise the high performance SuperJANET backbone, operated and maintained by JANET(UK), which provides services such as national IP video conferencing between RBCs and the delivery of common content to schools nationally, creating a true National Education Network.

The National Education Network potentially offers benefits and advantages for other areas of the public sector beyond education. The recent procurement of SuperJANET5 infrastructure included provisions for the use of JANET beyond education and training. The scope of the provision of JANET is defined as including "Local Authorities, Local Education Authorities and Unitary Authorities to serve the needs of adult and continuing education, and for other activities of the Authorities which are of benefit to the public, primarily but not exclusively in the context of education and training"[4].



The carrying of local authority traffic of non-education origin via SuperJANET now falls within the scope of the SJ5 procurement, offering considerable potential regional network aggregation delivering savings in cost and in network management resource across other areas of the public sector beyond education. This has already been the case in Scotland where the SSDN Interconnect has been carrying both Local Authority non-education traffic since its inception. There is a clear fit here with the *Transformational Government*[5] strategy, the government's strategy on using technology to transform government services.

There is thus a clear opportunity to extend the aggregation of service delivery to other areas of the public sector with a range of associated benefits and savings. The NEN through the RBCs is already starting to deliver connectivity to other areas of local

3 http://www.segfl.org.uk
4 http://www.ja.net/sj5/txprocurement/archive.html
5 Transformational Government: Enabled by Technology. Cabinet Office, November 2005

government, for example LA corporate internet and email, library connections for both administration and internet access and district council connectivity.

It is very important to consider the National Education Network as an emerging network and, like all networks, it will need to be continually reviewed and developed. There are parallels here with JANET(UK)'s development of SuperJANET. To ensure SuperJANET continues to meet the changing needs of its community, JANET(UK) periodically reviews and re-procures the backbone and services to ensure they continue to meet the needs of all its users.

The component regional and local authority networks that are interconnected by SuperJANET to create the National Education Network are similarly maintained to ensure that schools are able to benefit from new technologies, services and resources as they become available. However, such a process of continual redevelopment and improvement is dependent upon firm foundations and stability in provision to facilitate strategic planning, ensure optimal network design and provide best value procurement.

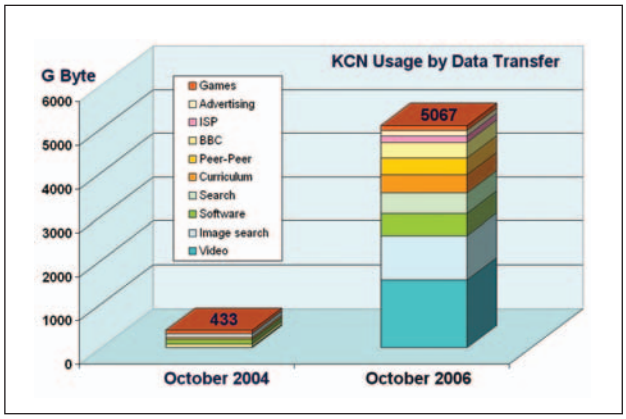
The regional broadband elements use a range of technologies to provide last mile connectivity between school sites and the regional core infrastructure. In the main these are true non-contended symmetrical dedicated connections, necessary to deliver quality connectivity for demanding teaching and learning applications. The national, strategic approach must be retained. However, headteachers continue to receive incorrect but apparently credible advice that there are cheaper broadband alternatives that will fulfil schools' ICT requirements. Higher school contributions, arising as a result of the increases to Openreach's pricing, could cause some schools to take the low-quality low-cost route.

Future bandwidth requirements

Demand for broadband services by schools continues to grow, creating requirements for increases to both school last mile bandwidths and core network capacities. It is estimated that school broadband usage has and will continue to increase at a rate of around 30-40% per annum. Sustaining such growth necessitates a continual cycle of development and review to meet increasing educational demands.

Already around 8% of secondary schools in England have 100 Mbps connections[6]. It has been estimated that a 100 Mbps capacity link carrier will be required for every secondary school over the next two years. Similarly some primary schools are exceeding the capacity of the standard 2 Mbps links and it is likely that increments to higher bandwidths (4 to 10 Mbps) will become their baseline, but over a longer period.

Growth in Data Transfer

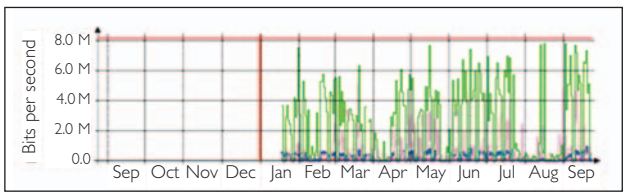


Figures from the Kent Community Network illustrate significant growth in use: an 11-times increase in data transfer by schools over the period October 2004 to October 2006.

Please also note the rise in video usage to become the largest use by data transfer.

EMBC: Removing a Bottleneck

Technologies will need to be applied carefully and selectively to ensure that suitably scaled delivery meets the diverse requirements of schools and that upgrade paths are available, avoiding potential future restrictions on schools' use. EMBC has recently redesigned and rebuilt its core network to meet similar levels of increasing demand and pressures for higher service level agreements, reliability and resilience.



This secondary school had a 2 Mbps connection up to January 2007.

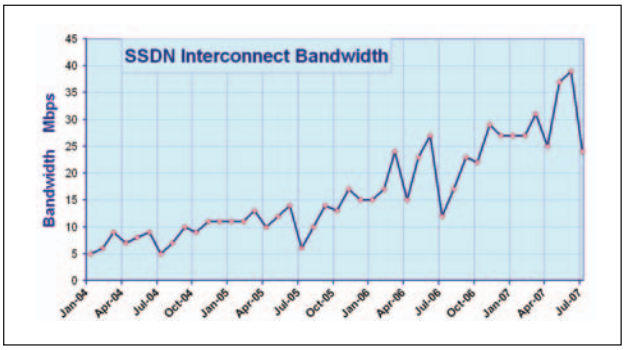
Within a month, bandwidth had increased to 4 Mbps and 9 months later to 8 Mbps.

6 http://bdct.becta.org.uk

All secondary schools within the Northern Grid for Learning RBC currently have 100 Mbps connections and almost all primary schools benefit from 10 Mbps circuits. The regional core network has been upgraded to accommodate these increases and to reduce bottlenecks. The network backhaul bandwidth has been doubled since its latest iteration in 2006.

Growth of interconnect bandwidth in Scotland.

The chart of Scottish Schools Digital Network (SSDN) interconnect traffic figures below shows that traffic levels have been increasing steadily since the facility was introduced. Increase in traffic levels is attributed both to increased use by existing users and also growth in the range of applications for which the network is used.



Over the last three and a half years, usage has doubled every 15 months on average.

NB Scottish school holidays start in July!

Changes in demand will dictate circuit upgrades and replacement of termination equipment (edge and core), driven both by changing applications and wider and more comprehensive use by schools. Additional circumstances that will need to be accommodated include new builds and refurbishments with network relocations (including BSF), school-end shifts and schools wishing to create a single collaborative curriculum and management networks between clusters of schools and sites.

Associated with these will be the replacement of school routers as these both reach end of life and require replacement to provide improved functionality and to enable greater bandwidth throughput.

Where network capacity needs upgrading it is essential to understand the implications for the range of technologies and equipment available and their pricing structure. Without this knowledge, and reasonable stability of funding streams, planning can only be undertaken in the short term, potentially causing delay and disruption to learning through mid-term changes in technology, leading to sub-optimal network design in terms of both cost and performance.

Further, without network and equipment refresh, the NEN will fail to continue to deliver leading edge and competitive connectivity at the outstanding levels of value for money demonstrated to date. Without equipment and circuit refresh it will become obsolete and will ultimately disintegrate if individual schools choose to opt out of the national approach en masse.

BT restructuring: impact on the National Education Network

Recent changes to the pricing structure of a number of BT products threaten to undermine the future continuation as well as development of the National Education Network by greatly increasing costs to RBCs, local authorities and schools. BT is the core provider of connectivity in nearly all areas of the UK. It is often the case that circuits provided by other communication providers will include the use of BT tails. The complex delivery chain means changes to BT's pricing can have an immediate knock on effect on other suppliers input costs, ultimately raising institutions' connectivity costs.

BT Openreach was established as a new division of BT, following Ofcom's Strategic Review of Telecommunications. Its remit is to provide fair and equal access to BT's local access and backhaul networks to all communications providers, including other divisions of BT. It was set up after BT reached an agreement with Ofcom to implement certain undertakings, pursuant to the Enterprise Act 2002, to address the findings of Ofcom's review[7]. Thus Openreach provides services to both BT and other communications providers, not directly to end customers such as RBCs and local authorities.

Openreach has conducted a review of the pricing structure of their portfolio of Ethernet products. This portfolio includes many of the circuits RBCs and local authorities use to build their regional networks and to provide many last-mile links to schools, including in particular wholesale extension services (WES) and similar. Openreach also provides these circuits to retail divisions of BT where they are resold as Ethernet Extension Services (EES) which

replace the previous LAN extension service (LES) products.

An Openreach Ethernet pricing customer briefing dated 14th March 2007[8] sets out the detail of the changes. This suggests that while one-off connection charges for some of the most widely used services for the NEN are set to decrease significantly (by more than 50% in some instances) over the next two years, some annual rentals will more than double over the same period. In some cases where RBCs have used the enabling of BT exchanges and Local Loop Unbundling this can be offset in part by the introduction of new products but this is only possible where particular network design topologies have been employed.

BT Openreach Rental Prices

Circuit Type	Rental Jan 2007	Rental June 2008	Increase
WES 10	£2340	£4200	79%
WES 10 LR	£1560	£4000	156%
WES 100	£5500	£5500	0%
WES 1000	£19600	£15000	-23%

BT Openreach prices are those which they offer products to other communications providers (including other divisions of BT), rather than end customer prices. Communications providers will apply their margins to the services they supply to their end-users, based on these Openreach input prices. Thus it is expected that over time all pricing of WES and EES circuits will be affected.

Openreach claims these price and product changes are necessary as a result of the equivalence of input required by the new regulatory environment. It has been suggested that previously some wholesale products may have been subsidised by the retail operation. The price changes are apparently intended to ensure that the prices for Openreach Ethernet products more closely reflect the underlying costs of supply by moving to a model with charges that more directly reflect the distance of each circuit and then rebalancing costs between provision and rental. This is in line with the regulatory requirement on Openreach for its prices to be cost orientated.

The new price structures are being phased in over an 18 month period which started in January 2007. The rises are part of a broader set of changes with some price decreases in higher bandwidth circuits and significantly lower connection charges. With patience, the cost to schools can be predicted. The principle factors are:

- Where fibre is used for school edge connections, 10 Mbps circuits predominate (primary and some secondary). For WES circuits, end-connection rental prices for 10 Mbps will much higher by June 2008, for instance WES10-LR circuits rental will have increased from £1560 to £4000.
- 100 Mbps circuits will be required by nearly all secondary schools over the next two-years or so. WES rental prices at this bandwidth have not changed, although there is no guarantee that these prices will not also increase.
- 1 Gbps circuits are currently only used for backbone circuits. Rental prices have reduced by 23% but the low proportion of 1 Gbps circuits (<3%) means that the effective reduction in total network cost is modest.
- In addition to the above changes in end connection rental price, the main link distance charge has increased from 50p per metre to 54p per metre.
- Excess construction costs have also increased and become more common.
- LES2 circuits provide 10 Mbps to many schools across the UK and are excellent value. However BT wishes to replace these inexpensive circuits as LES is apparently reaching end of life, although the technology should last many years. The replacement circuits are up to double the price. (see later)
- Some replacement paths are proving expensive and may require the full installation charge to be paid. One example is LES2 to WES100.

8 http://www.openreach.co.uk/orpg/news/productbriefings/wes/downloads/Briefing_ETH019_07.pdf

Products no longer available

A significant number of schools are connected using the BT LES2 fibre product. LES2 provides 10 Mbps full duplex (despite the product name) up to 3.5 km from an exchange, at a fair price. This product is no longer available for new supply although existing contracts will be honoured. The replacement product is over double the price and does not provide any improvement in bandwidth. There is also the cost and complexity of replacing circuits and the inevitable disruption caused to users.

BT Product	June '07 Rental	Typical Replacement	Price rise
LES2	£1250	£4000	220%
LES10	£2805	£4200	49%

RBCs are recommended to investigate extending LES2 contracts to 5 years for suitable LES circuits, to maintain the current price structure.

Thus it can be seen that the overall cost increase to the education sector will be very considerable. One local authority predicts an overall increase in BT rental costs (WES and LES) of £930k pa across the whole network. It may be possible to reduce this increase somewhat by moving to alternative circuits types with the potential disruption, management costs and in many cases the payment of the full new installation cost.

While reductions in installation cost are welcome, the effect is low as most school fibre circuits have been installed. In any case, this is a one-off cost now only applicable to upgrades, replacement circuits or new sites.

BT has introduced new products that could mitigate the increased rental cost in some cases. WES Local Access can be used where network nodes are located in BT telephone exchanges and have been adopted in EMBC and in Kent. The migration cost depends on the current local situation and can involve the full new installation cost. The costs of migration have to be incurred, therefore, before the benefit of the relatively lower rise in rental cost can be realised.

Since January 2007, BT has introduced new costs for the 'excess construction costs' of installing new fibre. That BT should pass on the costs of trench digging for remote schools is not unreasonable, but there are new and increased charges for the cable installation. Whereas before January 2007 excess construction costs in rural areas averaged a thousand pounds per school; the average is now several times higher, even excluding the cases where quotations over £100,000 are received. With developments such as new school builds, Building Schools for the Future and federations there is still a need for new installations. The new BT prices for excess construction costs make planning difficult and costs much more significant.

The BT notification can be seen at: http://www.openreach.co.uk/orpg/pricing/notifications/downloads/ACCN_OR046.htm

While 99% of schools have broadband connections, a significant minority of these are 2 Mbps or less and/or based on ADSL. Others utilise BT Learning Stream (delivered over Copper, Fibre and radio) which has both high revenue and replacement costs and may be reaching end of life.

Some RBCs are turning to local loop unbundling (LLU) which uses copper circuits with new technology devices to provide symmetric data connectivity. Under some conditions of short distance and availability of suitable copper circuits, LLU provides a considerably lower rental cost than fibre and can deliver useful bandwidths. LLU circuits can currently be delivered in 2Mbps steps over multiple copper pairs from enabled BT exchanges (to over 10Mbps). The circuits are distance dependent to about 3.5km but are much cheaper than fibre Ethernet connections even from the same enabled exchange. SLAs, particularly availability and repair times, are somewhat lower. To use this technology, however, the RBC must have invested in enabling local exchanges and have developed associated local backhaul networks.

Recommendations for RBCs or LAs

Establish Educational Need

- Celebrate good practice and market the benefits of integrated broadband services to every headteacher, chair of governors and IT co-ordinator.
- Work with schools to emphasise effective curriculum use of broadband, partly in order to postpone unnecessary and expensive upgrades.
- Discuss the developing educational requirements for broadband capacity and reliability, in order to enable strategic planning and the selection of the most appropriate design solutions.
- Model your telecommunications costs to predict the effects of the BT price changes. It will be necessary to give your headteachers and the Funding Forum as much notice as possible of increased funding requirements.

Develop an Intelligent Customer Role

- Ensure that your broadband supplier is fully aware of the BT price and product changes and can explain where alternative products may be appropriate. If in doubt obtain expert advice as the changes are very complex.
- Seek clarification on the contractual situation with regard to supplier input prices. Can the supplier pass on price increases? Be aware that a supplier may possibly stand to gain from BT price rises, if they apply a standard percentage mark-up on BT prices.
- Alternatively, if you have a fixed-price contract, be aware that the supplier may be severely affected by absorbing these BT price rises and may seek to reduce costs elsewhere. What can you expect on contract renewal?
- Where appropriate, seek to extend any term contracts for LES circuits.
- Ensure that BT invoices are analysed in detail, particularly where circuit types or pricing change. The complexity can confuse invoicing staff or systems.

Strategic Broadband Network Design

- Ensure you are using the best value circuit types (e.g. WES v EES) and that you or your supplier are purchasing from the BT Division (e.g. BT Openreach or BT Global Services) or mix of divisions that provides the lowest total cost.
- Investigate whether the cost of changing circuit type will reduce rental sufficiently to pay back the investment within a reasonable period.
- Enquire whether BT WES Local Access circuits are applicable to your network design.
- Local loop unbundling (LLU) or wireless point-to-point circuits can be effective in particular conditions, and are often cheaper than fibre.
- Seek to persuade BT nationally that they must liaise more closely with RBCs and LAs to ensure a far better understanding of BT products and pricing.

NEN Contact Details

For further information please contact:

Cumbria and Lancashire Education Online

Bailrigg House
Lancaster University Campus
Lancaster
LA1 4YE

Tel: 01524 592800
office@cleo.net.uk
www.cleo.net.uk

E2BN (East of England Broadband Network)

Saltmore Farm
New Inn Road
Hinxworth
Herts, SG7 5EZ

Tel: 01462 834588
admin@e2bn.org
www.e2bn.org

East Midlands Broadband Consortium

PO Box 216
John Dryden House
8-10 The Lakes
Northampton
Northamptonshire, NN4 7DD

Tel: 01604 236 182
embc@embc.org.uk
www.embc.org.uk

London Grid for Learning

CI Tower
St Georges Square
New Malden
KT3 4HG

Tel: 020 8408 4455
office@lgfl.org.uk
www.lgfl.net

Yorkshire & Humberside Grid for Learning

YHGfL Foundation
Normanby Gateway
Normanby Enterprise Park
Lysaghts Way, Scunthorpe
North Lincolnshire, DN15 9YG

Tel: 01724 275016
pat.donnelly@yhgfl.net
www.yhgfl.net

Northern Grid for Learning

11 Vance Business Park
Norwood Road
Gateshead
Tyne and Wear, NE11 9NE

Tel: 0191 461 1844
admin@northerngrid.org.uk
www.northerngrid.org

Northern Ireland: C2k

Ashfield Boys High School
Holywood Road
Belfast, BT4 2LY

Tel: 028 9027 9000
http://www.c2kni.org.uk/

North West Learning Grid

Cheshire House
Gorsey Lane
Widnes
WA8 0RP

Tel: 0151 423 8510
admin@nwlg.org
www.nwlg.org

Scotland: Glow

Learning and Teaching Scotland
The Optima
58 Robertson Street
Glasgow, G2 8DU

Tel: 08700 100 297
enquiries@LTScotland.org.uk
http://www.glowscotland.org.uk/

South East Grid for Learning

Easthampstead Park
Wokingham
RG40 3DF

Tel: 0118 978 9679
office@segfl.org.uk
www.segfl.org.uk

South West Grid for Learning

Great Moor House
Bittern Road
Sowton
Exeter, EX2 7NL

Tel : 01392 381371
enquiries@swgfl.org.uk
www.swgfl.org.uk

Wales: LLNW (Lifelong Learning Network for Wales)

c/o Welsh Networking Limited
Information Services
Cardiff University
40/41 Park Place
Cardiff, CF1 3BB UK

williams@cardiff.ac.uk
http://www.welshnetworking.net
/newsite/networks.htm#LLNW

NGfL Cymru

245 Western Avenue
Cardiff
CF5 2YX

Tel: 029 20265177
info@ngfl-cymru.org.uk
http://www.ngfl-cymru.org.uk

WMnet

Walker House
Radbrook Centre
Shrewsbury
SY3 9BL

Tel: 01743 246464
ray.hills@wmnet.org.uk
www.wmnet.org.uk

Editor

Peter Banbury
Secretary
NEN Technical Strategy Group
peter.banbury@kent.gov.uk