

Broadband Networking for Schools to 2012



The proposal to provide the government's specified broadband capacity without a school contribution by retaining 100% of the Harnessing Technologies Standards Fund grant.

In 2004, a number of educational and social principles were agreed, in order to respond to the diversity of Kent schools and their locations, which makes the delivery of broadband a challenge:

- All pupils, irrespective of school size, have an equal right to good ICT facilities.
- School contribution must not depend on location – whether urban, rural or coastal.
- Kent's broadband solution must be as good as any in the UK.
- To encourage teachers and pupils to develop new learning styles, broadband must be completely reliable and be supported by good technical and curriculum support.
- The technology must never limit curriculum vision.

The Internet and the World Wide Web have presented complex challenges to schools. The wisdom of the teacher has been challenged by the technological prowess of youth. However the response by most schools has been magnificent. Virtually every teacher has learnt how to incorporate this extremely powerful but potentially anarchic force into teaching. KCN and the supplier have had to redesign or upgrade many elements of the Kent Community Network in some cases several times.

The Immediate Challenges

- Delivering personalised learning is leading to substantial additional demands on broadband.
- Dedicated DCSF funding for broadband is available to 2011, but the structure does not support government advice to aggregate broadband delivery or respond to rural issues.
- The only telecommunications supplier in much of Kent is BT, which is increasing tail circuit prices by as much as 220% in some cases.
- The enhanced broadband delivery required by BSF must also be available to all KCC schools.
- Many rural local authorities are struggling to maintain a high quality broadband service.

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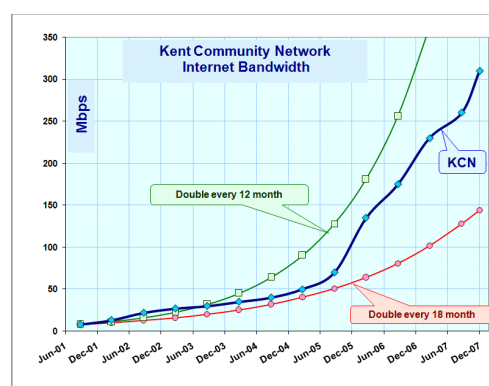
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Kent Schools' Internet use has grown by an average of 78% each year since 2001

1.0 The Proposal in Detail

1.1 Primary and Special School and PRU Connectivity

Currently 351 primary schools have 2 Mbps fibre links and a further 90 have 2 Mbps wireless links. Due to the robust KCN design, this capacity has proved sufficient for primary schools, although curriculum vision is driving demand upwards. Some smaller schools using advanced applications such as Flash Meeting and Infomapper require more bandwidth than pupil numbers suggest.

Although high-quality broadband is expensive to install, higher bandwidth becomes progressively less expensive to deliver, enabling schools to match capacity to demand.

KCN will:

- Ensure all primary schools have 10 Mbps capacity links, using either wireless or fibre.
- This capacity will be symmetric and uncontended and dedicated to the school or broadband cluster.
- Provide the DCSF specified 2 Mbps Internet bandwidth over these links without charge to the school, either for installation or for rental.
- Subsidise higher bandwidths. 4 Mbps at £1.5k pa and 10 Mbps at 3k pa. Thus a large school with strong ICT can obtain five-times the bandwidth for less than this year's contribution.
- Persuade the remaining 19 primary and one special school not connected to KCN, and the 32 schools still using ADSL to connect to the high quality KCN service (at no charge!).
- Support learning through well constructed and sympathetic curriculum and technical advice.

1.2 Secondary and Middle School Connectivity

Curriculum Internet usage is increasingly demanding, with more applications used simultaneously and more frequent use of search. 97 secondary schools out of 104 are connected by KCN. Many of the 10 Mbps fibre connections are reaching capacity and a substantial capacity increase is required.

KCN will:

- Upgrade all secondary school fibre connections to 100 Mbps by August 2009.
- Ensure an upgrade path to 1000 Mbps connectivity can be provided when required.
- Provide the current DCSF specified 10 Mbps uncontended, symmetric bandwidth without charge to all secondary and middle schools.
- Subsidised higher bandwidth provision in steps of 10 Mbps. Thus a school may upgrade to 20 Mbps at half this year's KCN contribution and to 30 Mbps and still save on contribution.
- Work with schools to ensure that curriculum applications will work across LAN and WAN.

Secondary schools will also note that KCN has provided a new Cisco 2811 router and a new filtering server this year, an investment of over £3k per school.

1.3 The Kent Learning Zone and VLEs

Harnessing Technologies is as much about the educational use of broadband as the connectivity. The single most used application will be the "Learning Platform" which is built on the fundamental communication and collaboration tools as required by DCSF.

The Kent Learning Zone (KLZ) provides a popular platform – see www.eiskent.co.uk (KLZ link)

The details need to be finalised but will include:

- KLZ licenses for every teacher in KCC schools.
- Hardware platform, storage and server licenses.
- Reduced price licenses for further school uptake.

Schools may run any secure VLE they wish over KCN. Some VLEs will integrate with KLZ.

1.4 Curriculum and Technology Support

Curriculum: Where learning has been transformed, it is the curriculum applications that have opened people's eyes and extended the educational vision. The role of the Advisory Service is vital in ensuring a return on the broadband investment.

- The role of Hands on Support in introducing new applications such as FlashMeeting.
- Ensuring that e-safety issues are addressed, for instance the "Think U Know" programme.
- Understanding how ICT supports the raising of standards.

Technology: Schools require that their voice is heard, individually and as the biggest single partner in the future Kent Public Service Network (KPSN). This responsibility is taken by CFE, but is delegated to EIS, particularly the contract management and "intelligent customer" roles.

- Resolving complex problems. There can be conflicts between the requirement for security of people and systems and the educational requirement for wide access. The KCN team, drawing on EIS expertise, manages the supplier and school contributions to the solution.
- No supplier is perfect, staff change and schools' requirements evolve. Management of the relationship with the supplier is essential using both formal and informal routes.
- Working with other Kent bodies in the development of mutual interests including Kentish MAN, KPSN, Kent Connects and KCC itself.
- Representing Kent schools requirements and concerns to national bodies.

2.0 Funding and Budget Background

There are major challenges to the Harnessing technologies grant, including the increase in telecommunications costs in July and December 2007 and again in July 2008. In addition to connectivity, schools also require educational services including KLZ, e-safety and good curriculum and technical support. We propose therefore that broadband at the DCSF target levels will be free to all KCC schools and PRUs, with enhanced service levels available, charged at cost or below.

2.1 Strategies to Reduce Cost

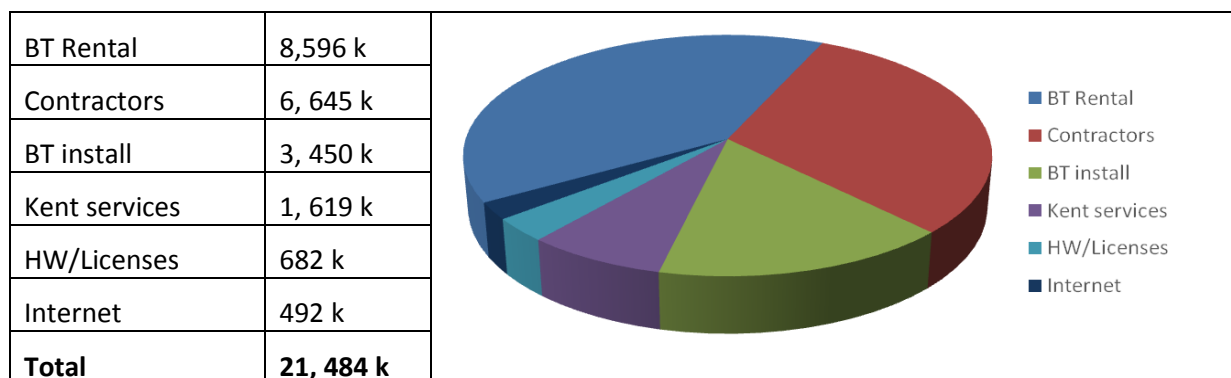
KCN is always looking to apply local knowledge and technological expertise to reduce costs:

- The most expensive BT link is a rural secondary school at £13,116 pa. We need to add costs of a router, filtering, maintenance to provide the "Edge Cost" for this school. Internet, backbone and management make up the 'core cost', giving a total of about £21k. However, this school hosts broadband to three primary schools, removing several expensive links.
- Romney Marsh schools agreed to join KCN early and together, justifying Kent investment in a new KCN hub in New Romney. Further savings may be possible, for instance Lydd Primary and Lydd Library share the same site, suggesting a single shared fibre link.
- Large construction costs may be incurred in connecting rural schools. One fibre connection cost £132k after other possibilities had been exhausted. Should a school terminate its fibre link, future re-installation could not be financed by KCC. Spreading install costs over Kent and over time enables such small schools to deliver high-quality broadband to their pupils, but we must ensure that the cost to the school is sustainable, to protect KCC investment.
- In 2004, KCN's 60 Mbps commercial Internet pipe cost £300k pa. The current dual 1000 Mbps Internet pipes cost a total of £136 k pa. This improvement in value is due to the collaboration with the higher education sector in Kent (we are a full member of KentMan) and JANET, the universities' network management agency.

Kent Public Services Network (KPSN): From April 2009, a partnership of schools, KCC corporate and District Councils will operate a joint network. The services to schools and the circuits used will change relatively little. However the central costs of the core network and Internet will be shared across a wider community. The KPSN will be able to grow in capacity and services beyond that which schools could afford alone.

2.2 KCN Expenditure Breakdown

The total KCN project cost over 3.8 years to August 2008 is £21.5 M. It is worth noting that the 2004 project cost, approved by Cabinet, was £24.3 M. The actual cost is £2.8 M lower due to the cost reduction strategies outlined above.



- BT circuit rental is the largest cost.
- The second largest cost is managed service contractors. Unisys is the largest by far. Research Machines supplies ADSL circuits and NCS supplies wireless links.
- BT installation costs are next, including “dig costs” to connect schools in remote locations.
- Kent supplied services such as the schools’ broadband helpdesk, the integration with school networks, plus advice on security, e-safety and problem resolution.
- Hardware and licenses includes hardware such as the Ironport email relays.
- Internet costs are now a much smaller part of the total.

2.3 BT Price Rises

BT has been split into two delivery companies, BT Openreach which is the wholesale arm and BT Global Services the retail arm. BT Openreach now supplies every communications provider including Unisys at the same prices and conditions, in order to promote competition.

BT has re-structured their products and prices as a consequence of the split. The effect on KCN cannot simply be described, except that every 10 Mbps ‘edge’ circuit feeding a school will increase in price at some stage by between 12% and 220% (sic). The 100 Mbps circuits do not change in price which helps KCN to increase the offer to secondary schools. The large backbone circuits have become about 23% cheaper.

A great deal of work, at national and local levels, is going into reducing the impact. However this provides one of the drivers for the proposal to change the funding structure for KCN.

3.0 References

- The KCN report for 2007: www.eiskent.co.uk?broadband
- Clusterweb e-safety materials: www.clusterweb.org.uk?esafety
- The Kent primary advisory site: www.kented.org.uk/ngfl