



Kent Community Network



Broadband in Primary & Special Schools



An overview for headteachers, ICT co-ordinators and governors of the options available and the issues involved in installing broadband Internet in schools.



Contents:

- Overview
- What is broadband?
- Do schools need broadband?
- Strategies for Internet access
- Criteria for school readiness
- What will broadband cost?
- References



Overview

Is the Internet just a passing fad that schools are expected to follow? What true benefits does it bring to the classroom or office? What are the options, timescales and costs?

This leaflet explains the issues involved for teachers and managers.

Three options are examined:

- Continue using ISDN for a while.
- Install lower specification services such as ADSL.
- Install or share the full broadband service recommended by DfES.

A half of UK homes now have Internet access. Children can email family and friends across the globe and use the Web to provide first-hand information about other countries and cultures. The Internet, which enables this collaboration, research and publishing, is changing all our lives. Schools recognise the opportunities to enhance learning, improve administration and communicate better with the community.

The Internet is a powerful tool for teaching and learning. Enter the phrase “Crocs on Film” into a search engine, be amazed when 5 billion web sites are searched in under a second and locate a useful KS2 resource with video clips of crocodile movement.

All pupils should have access to such rich learning materials.

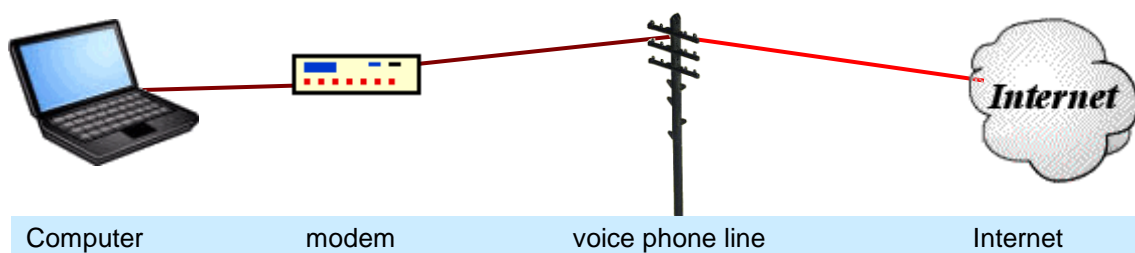
Email and personal phone messages can bypass the school’s protective walls. We must help pupils to use this technology well and to evaluate material accessed, keep them safe while learning and alert them to the dangers of using the Internet outside school.

What is Broadband?

- Sufficient capacity (bandwidth) for use by many computers at the same time.
- A fast network for access to interactive learning materials using sound and video.
- Reliable and safe connections so that teachers can plan ICT use in confidence.
- Easily available technical support for curriculum and administration use.
- Compliant with industry standards and national DfES requirements.

Single Computer Internet Access

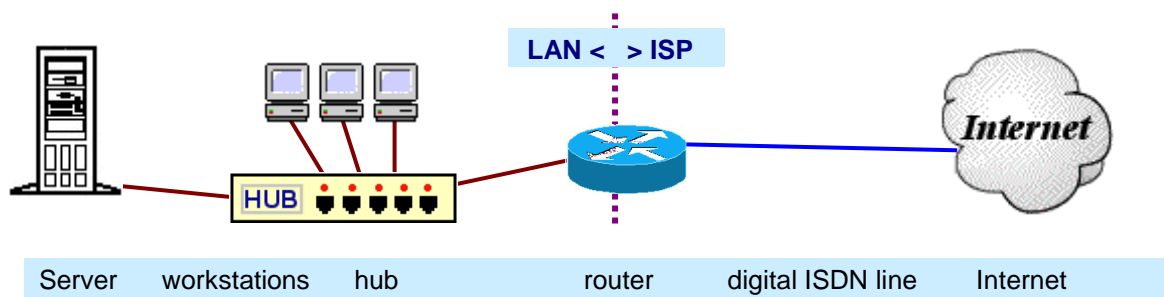
Most primary and special schools in Kent started exploring Internet use with stand-alone computers such as the NGfL laptop or a single desktop. A modem is used to connect each computer to the Internet via an ordinary voice telephone line. One phone line is needed for every computer that requires simultaneous Internet access. The “connection speed” is around 56 Kbps (kilo bit per second). This bandwidth is fine for a single computer using straightforward web sites that do not contain animation or sound.



Networked Internet Access with ISDN or ADSL

Most school computers are connected together to make a local area network (LAN), enabling collaboration and the sharing of printing and the Internet. Until recently, the connection to the Internet has been an ISDN line, which is designed to handle data and is more reliable than a voice phone line. A 128 Kbps ISDN line has a bandwidth about 2.5 times that of a voice line. However, sharing the line between many computers on a network reduces the speed of Internet access at each workstation. ISDN can be a reasonable solution for networks of less than 10 computers, but is inadequate for the more complex web sites, particularly where video clips or streaming is required.

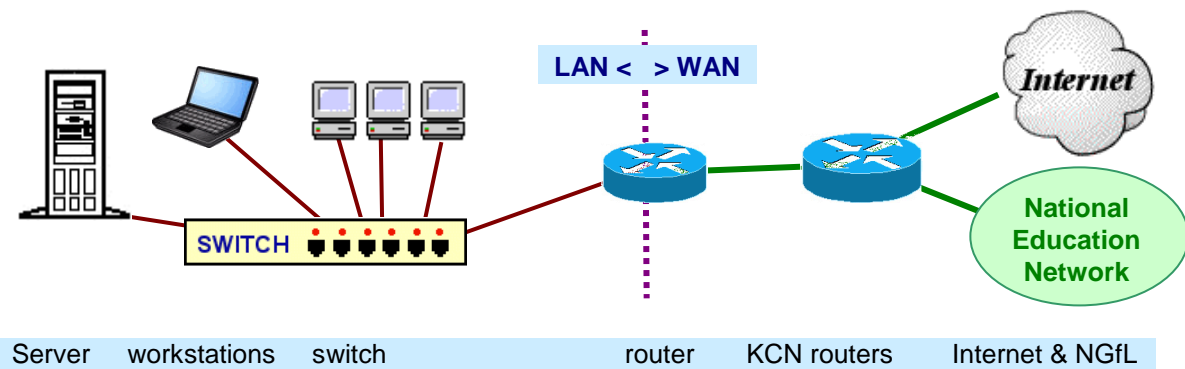
ADSL is a higher bandwidth replacement for ISDN. In many parts of Kent it is possible to get an 'up to' 2 Mbps (mega bit per second) ADSL connection to the Internet, which will usually be faster than ISDN. However ADSL does not provide full Internet access, particularly as the bandwidth is shared across 20 schools or businesses. Nevertheless ADSL will provide an interim solution for some small primary schools for a year or so.



DfES Specification Full Broadband

A full broadband connection is a much faster Internet connection than ISDN or ADSL. The Kent Community Network (KCN) is a wide area network (WAN) that combines schools' requirements and shares the expensive high-speed Internet feed, firewall and central services such as Help Desk. A DfES specification broadband service operates at over thirty six times the speed of a modem and voice phone line!

Curriculum Online and e-Learning Credits have increased the availability of media-rich online learning materials which require a fast connection. However the Internet varies in speed through the day and can be affected by network overload. The DfES specified broadband service connects to the National Education Network to enable faster access to curriculum materials without depending on the variable-speed Internet.



Do Primary and Special Schools Need Broadband?

In 1998, Kent was the first large LEA to connect every school to the Internet. Every school now has a networked Internet connection and most new curriculum and administration computers are networked. The Curriculum Online initiative, the BBC Digital Curriculum and e-Learning Credits are just three of the major initiatives that will lead to a greater demand for broadband Internet.

Reasons why schools need broadband:

- Administrative systems increasingly require reliable Internet access to obtain documents no longer sent by post.
- More Internet connected computers across the school and particularly ICT suites require faster connectivity than ISDN can provide.
- The 'always-on' nature of broadband encourages use by pupils and teachers.
- Many of the best web sites include complex graphics and animation. Such pages must load quickly to retain pupils' attention and a broadband connection is essential even for a single computer!
- Video streaming and video conferencing require higher quality connections with "quality of service". Conferencing will steadily become more important.
- The developing Curriculum Online materials, the BBC Digital Curriculum and online content from educational suppliers, will assume a broadband connection.
- Pupils and staff require access to school material from home.
- The National Education Network (NEN) will bypass the variable quality Internet. It is essential that schools obtain broadband services that have this national connection

Report from a Primary School with Broadband

As part of the SEGfL investigation into broadband in primary schools, curriculum adviser Helen Smith visited Paulsgrove primary school in Portsmouth, which had been using broadband for six months. Helen reported fascinating lessons centred on research and report writing including one using video clips of crocodile movement.

The report concludes:

"There are 3 arguments in favour of broadband in primary schools:

- *The slowness of ISDN on large networks is a barrier, and a deterrent. For this reason alone, schools need higher bandwidth.*
- *Broadband may enhance the use of the Internet in schools where there already is satisfactory delivery via ISDN. Quicker access to a range of resources may have significant impact on whole-class teaching. Less time is wasted, and teacher confidence is boosted.*
- *Broadband offers unique possibilities. For example, teachers may integrate on-line video into presentations, which is impossible with low bandwidth.*

At Paulsgrove, I saw evidence to support all three arguments. There is a further area of potential: that broadband may in future be used to deliver complete units for curriculum support. Staff await developments with interest, but little has yet been seen."

The full report may be obtained from the EIS Web site (address at end).

Strategies for Broadband Internet Access

1) Full Broadband, as Defined by the DfES

The Kent Education Network full broadband service looks forward to the type of learning described by DfES in 'Fulfilling the Potential', which provides a vision for the future of ICT in schools. The DfES assumes ubiquitous, broadband Internet access in schools and in due course across the whole community.

The new Kent Community Network has a much greater coverage of Kent through the use of four times as many local connection points or hubs. From April 2004 fibre-optic connections at up to 10 Mbps will be available to most primary and special schools.

The DfES specification includes:

- Upload and download speeds both at 2 Mbps or better (a symmetric service).
- Sufficient capacity for heavy use, i.e. a low contention ratio.
- A quality of service (QoS) suited to educational applications such as video.
- A connection to the National Education Network, i.e. pupils can access learning content from anywhere in the UK without having to use the variable speed Internet.

2) Broadband Clusters

A full KCN broadband connection has sufficient capacity for a secondary school, at least 200 computers. Neighbouring primary and special schools can be linked together to share a single KCN robust Internet feed, forming a broadband cluster. Despite additional equipment costs, a saving can be passed on to the schools. However the most important advantage is that broadband clusters can enable smaller schools to gain early access to full broadband.

Criteria for Broadband Readiness

DfES requires all schools to have full broadband by 2006. Schools will need to decide whether to upgrade broadband connection immediately or to wait a little. The following criteria have been accepted as a reasonable way to prioritise broadband installation.

Criteria for broadband:

- Good use is being made of the Internet via the existing access method.
- Broadband use is explored in the school's ICT Development Plan and staff are ready to exploit the benefits of Internet access in the curriculum and in administration.
- The school financial contribution can be found for the next two years.
- The school network complies with industry standards and is ready for broadband.

The KCN project will work with all schools, irrespective of size or location, to identify the right type of broadband connection for their educational requirements. It is a Kent principle that the school contribution will depend on the level of service, not on location.

It is difficult to deliver broadband to some rural communities and costs to the project can be many times higher than for some urban locations. Some rural communities are seeing this as an opportunity for the whole community to work together to make best use of the broadband feed.

Most of the school connections made by the new Kent Community Network can be shared with local public services such as libraries and community centres, although additional costs such as wireless links will need to be covered.

What will Broadband Cost?

From April 2008 Primary and Special schools are offered 2 Mbps bandwidth without charge. This bandwidth is symmetric and uncontended, i.e. robust enough to be used by 50 or more computers. Higher bandwidths will be available at a subsidised rate.

References

Kent Community Network: further information

<http://www.kenttrustweb.org.uk?ict> (broadband services link)

KCN Broadband Web Site

- Leaflets and letters produced by the Kent Community Network.
- Network Security Policy
- Frequently Asked Questions – responses to schools' requests.

<http://www.kent.gov.uk/eis> (select broadband link)

Fulfilling the Potential – DfES vision for ICT in schools

<http://www.dfes.gov.uk/ictfutures/>

Curriculum Online – the new portal for learning materials

<http://www.curriculumonline.gov.uk/>

Kent NGfL Web Site – good practice and the School Internet Policy

<http://www.kented.org.uk/ngfl>