

Broadband

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1. What is broadband?

Broadband is the term used to describe “higher bandwidth, always-on services, offering data rates of 128kbps and above”. This definition of broadband is used by the Office of Communications (Ofcom) for the purposes of measuring take-up in order to capture the dynamic range of services available to residential and business consumers that are classed by the industry as broadband. This definition gives Ofcom data that is comparable with broadband take-up figures published by other countries in Europe.

Broadband will allow businesses to save time - and money - on the Internet. Put simply, they can do this because large data files can be downloaded at much greater speeds. Businesses stand to benefit from productivity

improvements; for example, improved low transaction cost communications with customers and suppliers. Some other practical uses include having catalogues and stock databases hosted by a specialist ISPs with connectivity and round-the-clock back-up resources, the ability to set up virtual private networks (VPNs) with branch offices for off-site workers, and live video streaming (including video and audio conferencing) over the internet. Broadband also enables application service provision that permits the outsourcing of IT functions and enables companies to focus on their core business.

For consumers the Internet can be accessible from several PCs / digital televisions in the house and the telephone can still be used - all at the same time. Online gaming, music, video and television on demand will become an everyday commodity.

Broadband will also permit two-way, real-time visual communication offering huge potential to initiatives such as NHS Direct as well as urgent diagnosis and medical advice over long distances, and opportunities for long distance learning and the delivery of other key public services.

In January 2005, Ofcom announced that broadband take-up has continued to grow in the United Kingdom, helped by the introduction of new services, including higher speed services and a number of price cuts. By end December 2004, the number of broadband subscribers was estimated to have passed some six million. The latest figures from the ONS show that broadband is a more popular means of accessing the Internet than un-metered dial-up; 38% of all Internet connections are via broadband. Broadband users are more than twice as likely to download music and videos as dial-up users.

The last few months have seen the emergence of some combined voice and broadband products and signs that providers are looking to utilise the potential of Local Loop Unbundling (LLU). ISPs are also now beginning to see Voice over IP services (VoIP) as a vital tool in growing their subscriber base. Further details of the new broadband services are available in Ofcom's *The Communications Market Quarterly Update January 2005*, on the Ofcom website <http://www.ofcom.org.uk>.

2. What are the different types of broadband?

DSL (Digital Subscriber Line) technologies

DSL technologies enable broadband services to be delivered over the existing copper loops that extend into all households and businesses that have a fixed telephone line. On 18 August 2004, BT announced the removal of the distance-related limits for 512 kbps ADSL, which should enable 99.4% of lines

that are connected to a broadband exchange are able to receive this service by Summer 2005. DSL technologies generally offer users speeds ranging from 256 kbps to 10-20 Mbps.

Cable modems

Cable networks offer a supply route for higher bandwidth services to both the residential SME and the large business market. A cable modem offers a similar speed to basic ADSL services (c. 500 kbit/s).

Fibre

Fibre installed direct to a consumer's house or to a business premises will provide higher bandwidth access with delivery rates above those achievable with DSL technologies. Installation of fibre to replace the copper loop is expensive and at least in the short term, there is unlikely to be widespread installation and deployment of fibre direct to low volume customers' premises although the use of fibre to distribution points (e.g. street cabinets) may become economic over time.

Satellite

Satellite is commonly used to provide one-way higher bandwidth capability (e.g. for television broadcasts). Provision of two-way higher bandwidth capability over satellite is not common. There are a number of advantages to satellite technology – in particular it is capable of reaching remote rural areas where other types of provision may not be technically feasible or economically viable. Two-way and one-way satellite access is also available throughout the UK, offering the potential to reach those parts of the UK outside of the reach of either ADSL or cable modem services. Satellite also has the potential to provide backhaul for community broadband providers. There are over 70 satellite service providers in the United Kingdom (Source Ofcom).

Leased lines

Leased lines are permanent telecommunications links supplied by network operators to users, which provide capacity dedicated to the user's exclusive use. They are used by large businesses and some SMEs to carry high volumes of voice and data traffic. They are also used by other telecoms operators and service providers and so underpin many other services and provide the 'backbone' for the mobile networks. Internet Service Providers use leased lines to connect to the Internet and to offer high speed Internet access to business consumers.

Fixed Wireless Access

Broadband fixed wireless access allows users to take advantage of cheap, fast Internet and multimedia access through radio links between an aerial located on the user's premises and a base station, rather than down a telephone line. The Government held an auction in November 2000 of spectrum in the 28 GHz bands that can support two-way higher bandwidth and broadband services. The regions where licences were sold cover 57 per cent of the UK population and include both Scotland and Northern Ireland.

In June 2003, the Government held an auction for 3.4GHz Public Fixed Access Wireless Licences. All fifteen licences were sold. By May 2004, UK Broadband Ltd., a wholly owned subsidiary of PCCW, launched a new netvigator service in the Thames Valley area using this spectrum.

At a regional level, a growing number of groups are developing community wireless networks, especially in areas where ADSL and cable modems are not available. Both residential and business users are using these services.

On 13 January 2005, Ofcom announced that it is seeking views on proposals to make a significant number of spectrum bands available to the market over the next few years. This consultation also outlines options for extending spectrum trading and liberalisation to mobile phone services. The consultation is part of Ofcom's wider programme of making greater use of market mechanisms to manage spectrum. The spectrum bands in this consultation include:

10GHz, 28GHz, 32 GHz and 40GHz (available at varying times, from 2006 to 2008). These bands offer significant amounts of additional capacity for a range of new services. Licences that were not assigned during the previous award of spectrum licences for broadband fixed wireless access at 28GHz, are also included.

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3.6–4.2GHz, which are presently used for high speed fixed links, satellite services and fixed wireless access. Subject to further work on sharing issues, additional capacity may be available for further terrestrial applications.

Further particulars of all proposals for using of the radio spectrum for wireless broadband from December 2003 are available on the Ofcom website at: <http://www.ofcom.org.uk/>

Wi-Fi

There are a number of different wireless technologies that can offer broadband access, the most common of which is Wi-Fi. Increasingly lap-tops have a Wi-Fi chip as standard which allows users to access broadband via “hot-spots” located typically in conference centres, hotels, transport hubs, coffee shops etc. Wi-Fi uses licence–exempt spectrum at 2.4Ghz and 5GHz, has a range of 10-100m and can deliver around 2Mbps. Wi-Fi is based on the IEEE 802.11 standard, new versions of which are being developed. Ultimately Wi-Fi could deliver upwards of 100Mbps.

It is a nomadic, rather than mobile technology in that hand-over is not possible. There are a number of issues surrounding Wi-Fi, notably security, billing and interference, but it is cheap to install and does deliver good download rates.

Wi-Fi is not the only wireless technology, which can deliver broadband. WiMax is being developed around the IEEE 802.16 standard and promises a medium range (10km) with high speed downloads (c70Mbps). Other technologies are under development, for example UWB that promises extremely high rates but only over very short ranges.

3G

Although primarily seen as providing mobile telephone services, 3G can also be used to provide true mobile broadband.

There are five 3G licence-holders in the UK – Vodafone, Orange, T-Mobile, O2 and “3” (owned by Hutchison). Four networks have launched a 3G service: 3, who offer mainly talk and video services, Vodafone and Orange, who have launched both 3G datacards and voice/video services and T-Mobile (datacards only). O2 and T-Mobile are both expected to launch 3G voice services in 2005.

The 3G datacard is designed for use with laptops and will allow them to access the issuer’s 3G network. 3G at present can provide download rates of around 384kbps. However 3G is at the start of its development cycle and enhancements, which will give rates of 2mbps are anticipated within a couple of years. Ultimately use of multiple antennas could deliver rates of 10+mbps. The rates a user will actually get depend on the degree of demand at a given site and given time.

3G datacards have a number of advantages over other wireless technologies. 3G is true mobile broadband, it is relatively secure, and billing arrangements are straightforward. Under the 3G licence conditions, each operator has to

provide 3G coverage to 80% of the UK population by 2007. For areas outside of 3G coverage, the datacard defaults to GPRS. The latest datacards can allow the user to switch between Wi-Fi, 3G and GPRS, depending which service offers the best download rates in a given location.

3. Can I get broadband where I live?

An estimated 96% UK homes and businesses have access to broadband via DSL or broadband enabled cable. By the end of December 2004, the number of broadband subscribers was estimated to have exceeded six million and the take-up by new subscribers is increasing between 50,000 to 60,000 per week. Broadband fixed wireless access offers broadband to around 13% of the UK and satellite, though not currently a mass-market product has the potential to deliver broadband across 99% of the UK 3G, while still at an early stage of rollout, will provide coverage to 80% of the UK population by 2007. There are some 4,000 Wi-Fi hotspots in the UK.

Telewest has completed its network upgrade and is now offering services up to 4Mbps. Ntl announced in November 2004, that it had completed the acquisition of Virgin Media Group's remaining interests in Virgin net giving 100% ownership of the ISP, which has around some 600,000 customers.

By mid-February 2005, BT had upgraded 4,261 exchanges across the UK for ADSL. BT has announced that from Autumn 2004 to Summer 2005, around 100 exchanges a month will be upgraded. Once this work has been completed, an estimated 99.4% of UK homes and businesses will be in an area connected to a DSL-enabled exchange (Source Ofcom).

The Government has commissioned market research to monitor the status of broadband across the UK, including estimates of regional availability data. Four reports are published annually: two that give fuller details every six-months and two interim summary reports for the intervening quarters. Key findings from the latest full and interim summary issues of the UK Broadband Status Reports are published on this website.

4. How many broadband subscribers are there in the UK?

The UK broadband market continues to grow apace. By the end of December 2004, the number of broadband subscribers was estimated at over six million, with new subscribers growing at some 50,000 to 60,000 each week. This means that broadband accounts for 38% of all Internet connections and has surpassed the number of unmetered dial-up connections. And, while less directly comparable, the number of broadband lines is now greater than the number of ISDN channels in the UK. By September 2004, Ofcom estimated the proportion of all Internet

connections attributable to broadband had already passed a third and on current trend should reach 50% in the first half of 2005.

Competition in the broadband area remains strong and there is a clear trend amongst ISPs to increase the basic speeds available to consumers. Services are now available in some areas at speeds of up to 8Mbps. Demand for such speeds seem certain to increase if recent patterns of broadband use are a guide.

Broadband rollout is now being implemented by a planned programme that will take coverage from an estimated 96 per cent of UK homes and businesses by end February 2005, to over 99 per cent by Summer 2005.

5. Will the UK meet its target of having the most extensive and competitive broadband market in the G7 by 2005?

Since the announcement of this target in 2001, the Government has commissioned research to benchmark the progress of the UK against the other G7 countries (Canada, France, Germany, Italy, Japan, UK and the USA), also Sweden, Ireland and Australia. The latest report, commissioned from Ovum, for the period April to September 2004, shows that the UK now has the most extensive broadband market in the G7. The UK was in third place for competitiveness and closing the gap on Canada, the second placed country.

The broadband target contributes to the overall target for the UK to be the best place in the world for e-business, as broadband is the underpinning infrastructure for modern information and communication techniques. The International Benchmarking Report 2004 'Business in the Information Age', also commissioned by DTI, showed that the UK was second in a series of international comparative measures of business uptake and use of information and communication techniques.

The Government is commissioning further reports from Ovum to cover the remaining period to the end of 2005 in support of its overarching 2005 broadband target. The key findings from each updated report are published on this website. DTI also issued a Press Notice on 21 February 2005 to announce that the UK had topped the G7 broadband availability league.

6. What can I do if my broadband service is poor?

To make a service complaint about your broadband supplier, either contact your operator's customer services department directly or e-mail/telephone

Ofcom's Contact Team to register your complaint and receive advice:
http://www.ofcom.org.uk/contact_ofcom/tel_issues.

7. Where can I surf the Internet and send e-mails from public locations?

Wi-Fi hot spots are based on the 802.11b standard, and allow anyone with a wireless-enabled PDA or laptop to surf the Internet and send e-mail at high speed, without having to plug into a network. Wi-Fi hotspots are being built throughout the UK at locations such as railway stations, airports, business parks and coffee shops. A number of operators are offering services, including BT Openzone, T-mobile, Megabeam and UK Explorer. The Government is also supporting a series of pilot schemes looking at providing Wi-Fi access in public libraries.

8. What is Government doing to help businesses get broadband?

Achieving Best Practice in Your Business is a key theme within the Department of Trade and Industry's (DTI's) approach to business support. The DTI is committed to ensuring that UK businesses can exploit the immense potential of the information age and has set the goal of making the United Kingdom a world leader in e-business.

DTI has streamlined the way in which it provides advice and support to business in order to make it simpler and more efficient for business to access the support on offer. The e-business agenda has been integrated into a new product, Achieving Best Practice in Your Business.

A core aspect of the work of this service is to promote the benefits of broadband to small and medium sized businesses (SMEs). Businesses will be able to access publications, tools and advice on adopting best practice to address business problems, including how adopting broadband can deliver improved business performance. This includes a guide to broadband for businesses, case studies and a booklet answering frequently asked questions about broadband. More information regarding the Government's business support solution Achieving Best Practice in Your Business can be obtained from the website:

<http://www.dti.gov.uk/bestpractice>.

9. What other measures has the Government set in place apart from a minimal £30million Broadband Fund to ensure that all households will receive broadband?

The £30million fund was created to allow RDAs and devolved administrations to develop schemes for extending broadband networks to areas, which would

otherwise not appear commercially viable. These were announced by the Government on 19 March 2002 and include wiring up business parks in Yorkshire and Humberside with broadband links; trials of new and varied technologies such as wireless or satellite broadband in rural areas of the East Midlands; providing SMEs in the South East with broadband connections at reduced or free rates; 'Broadbanding Buckfastleigh' introducing Buckfastleigh in Devon to the benefits of broadband by linking up the school, health centre, town hall and library to broadband and establishing a community access centre.

The £30m fund is not the extent of the Government's commitment to broadband. The Government is also:

- working with industry through the Broadband Stakeholder Group, which acts as an independent advisory body to the Government on the development and implementation of a suitable strategy to achieve Government strategic targets that include broadband.
- working with other government departments to identify ways of accelerating progress towards more extensive broadband in rural communities. The Department of Trade and Industry's Broadband Team includes a secondee from the Department of Environment, Food and Rural Affairs (Defra). The Team is focusing on the problems and issues relevant to rural areas and is working closely with both ICT and rural specialists in other Departments, RDAs and local authorities to identify best practice and value for money. Amongst other initiatives, the Team has issued a broadband toolkit to help rural communities and businesses understand the issues surrounding access to broadband and a Broadband Case Study CD-ROM. It provides almost 500 real-life examples from around the UK of how businesses, communities and households have benefited from the many new opportunities that a broadband connection has to offer.

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- aggregating the demand for broadband connectivity in public services through the Broadband Aggregation Programme (BAP), which is a joint central Government and Regional Development Agency (RDA) initiative. It was established to aggregate public sector demand for broadband via regional aggregation bodies - Adits. Demand aggregation offers a more attractive market for infrastructure providers and facilitates better value deals, benefiting the private as well as the public sector through increased infrastructure build. Further details about the BAP are available from the Adit
- website: <http://www.adit.gov.uk/>.

10. What is Ofcom (the Office of Communications) doing to promote broadband?

On 29 December 2003, Ofcom became the new regulator for the UK communications industry. Ofcom inherited the duties of the five existing communications regulators: the Office of Telecommunications (OfTel), the Broadcasting Standards Commission (BSC), the Independent Television Commission (ITC), the Radio Authority and the Radiocommunications Agency. Amongst its new obligations under the Communications Act 2003 (Chapter 21, s3 (4) (e), Ofcom is required, when carrying out its functions, to 'have regard', amongst other things, to the desirability of encouraging the availability and use of high-speed data transfer services throughout the UK. This is a new duty introduced by the Communications Act 2003, which did not apply to the previous regulators.

Further particulars, including a range of new initiatives, are available on the Ofcom website: <http://www.ofcom.org.uk>.

11. What is being done to stimulate competition in the market?

Many consumers now have a choice between packages. The UK has one of the most competitive marketplaces in Europe for broadband, with competition at the infrastructure level between cable providers and DSL and numerous service providers competing with BT to provide retail DSL services to customers: for example, from Internet Service Providers (ISPs) such as Freeserve and AOL.

Competition in the upgrade of the local loop is also being facilitated through Local Loop Unbundling (LLU). This process enables operators to connect to the consumer via BT's copper local loops. Ofcom believes that development of the LLU market, to allow operators to target infrastructure investment and to develop scale in the creation of high-speed data services will be critical in ensuring a fully competitive and innovative telecoms market for the longer term. Ofcom's charge reductions following consultations in 2004, came into effect in January 2005.

12. What is the Broadband Stakeholder Group?

The Broadband Stakeholder Group (BSG) was set up in April 2001 as an independent advisory group whose remit was to inform and stimulate the development of the Government's broadband strategy. It brings together players from all sections of the broadband value chain and includes broadband infrastructure, service and content companies and broadband users from the private and public sectors. The Government fully supports the strategic approach adopted by the BSG and has drawn heavily on their recommendations in the formation of its own broadband strategy.

In January 2004, the BSG published their Third Annual Report and Strategic Recommendations. This report completes the BSG's activities in developing recommendations to help the UK achieve its goal of having the most extensive and competitive broadband market in the G7 by 2005. This report recognised the substantial progress in the development of broadband through 2003, but acknowledged there is much more to be done before the absorption of broadband into the fabric of social and business life of the UK is achieved.

A response from the Government and Ofcom was published on this website on 5 April 2004.

On 27 September 2004, the BSG announced a new programme to accelerate the development of the next generation broadband, which is focusing on eliminating the remaining barriers to the adoption, adaptation, and absorption of broadband-enabled technology, content, applications and services by consumers, enterprises and the public sector.

For further enquiries about the BSG please contact:

Camilla Young, Administrator, Broadband Stakeholder Group, Intellect, 10-12 Russell Square, London WC1B 5EE.

Tel: +44 (0)20 - 7331 2028; e-mail: camilla.young@intellectuk.org.

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