



Broadband Options

Blue Saffron
more than just IT

Broadband Options

There has been a huge rise in bandwidth demand from our customers in the last few years. All modern businesses need faster, more resilient and more reliable connections to the internet.

But Broadband has changed, it is still changing and it will continue to change.

Not too long ago the population were ignited by the arrival of ADSL Max, suddenly we had access to speeds of up to 8Mbps download which dwarfed the previous maximum of 2Mbps.

Now we are looking at consumer services of up to 50Mbps and beyond, whilst businesses in certain areas can benefit from speeds of 100Mb and beyond!

Super-fast fibre connections are no longer the preserve of large corporations with thousands of employees and big budgets. In fact , whether or not a 100 Mbps fibre connection is good value often has far more to do with how a company uses its connection rather than the number of people in the organisation. For example an online retail business requires high capacity and high performance connectivity but may have relatively few employees.

The media (or physical connection type e.g. fibre or copper) used for Broadband access has changed – different technologies have once again extended the life of copper wire by providing speeds of up to 40Mbps . Fibre is now getting closer to the business door step, it has reached the cabinet at the end of the street, in fact many cable providers are already providing fibre to the premises. Fibre allows the provision of very high speed transmission – typically 50-100 Mbps for consumers and beyond Gigabits (1000Mb) for businesses

Wireless has also come of age. Using a variety of options based upon using different bands of the

spectrum, technologies such as WiMax, 3G and laser links (infrared point to point) have also opened the door to higher bandwidths for many businesses.

TECHNOLOGY TYPES	EtherStream		
	SureStream		
	Leased Line		
	SDSL		
	SDSL LLU		
	ADSL		
	ADSL LLU		
	ADSL2+		
	ADSL2+ LLU	ADSL2+ Annex M	
	EFM	ADSL2+ LLU Annex M	
	GPRS	ADSL2+ FTTC	BPL (Broadband Over Power Lines) up to 6Mbps over domestic power lines
	3.5G / HSDPA	ADSL LLU FTTC	VDSL (Very High Data Rate DSL) up to 52Mbps
	WiMax	100 Mb Fibre	FTTH (Fibre To The Home) up to 100Mbps
2009	2010	2011 >	

Any company that wants to make the most of new services, such as cloud computing, HD video-conferencing, voice over internet protocol (VoIP) technology, real-time backup or sending and receiving large files , will want the fastest connection possible to makes sure their business runs smoothly . If not, its existing infrastructure could be in danger of slowing down and will struggle to cope hence compromising service delivery. Equally for most companies, a

connection to the internet is vital so resilience is another key factor – again there are options here that vary from simply increasing to Enhanced care on basic connections to deploying fully resilient failover and load sharing solutions.

We know the enthusiasm for these services is widespread. Research has shown that over half of UK SMEs plan to switch their core applications to cloud computing systems in the next year, compared with the 22 per cent that had planned to in 2008.

(source: Quocirca 2010)

As the reliance upon these bandwidth-hungry applications grows, so too will the need to think seriously about investing in faster and more reliable connectivity, and in particular fibre.

Focus on fibre

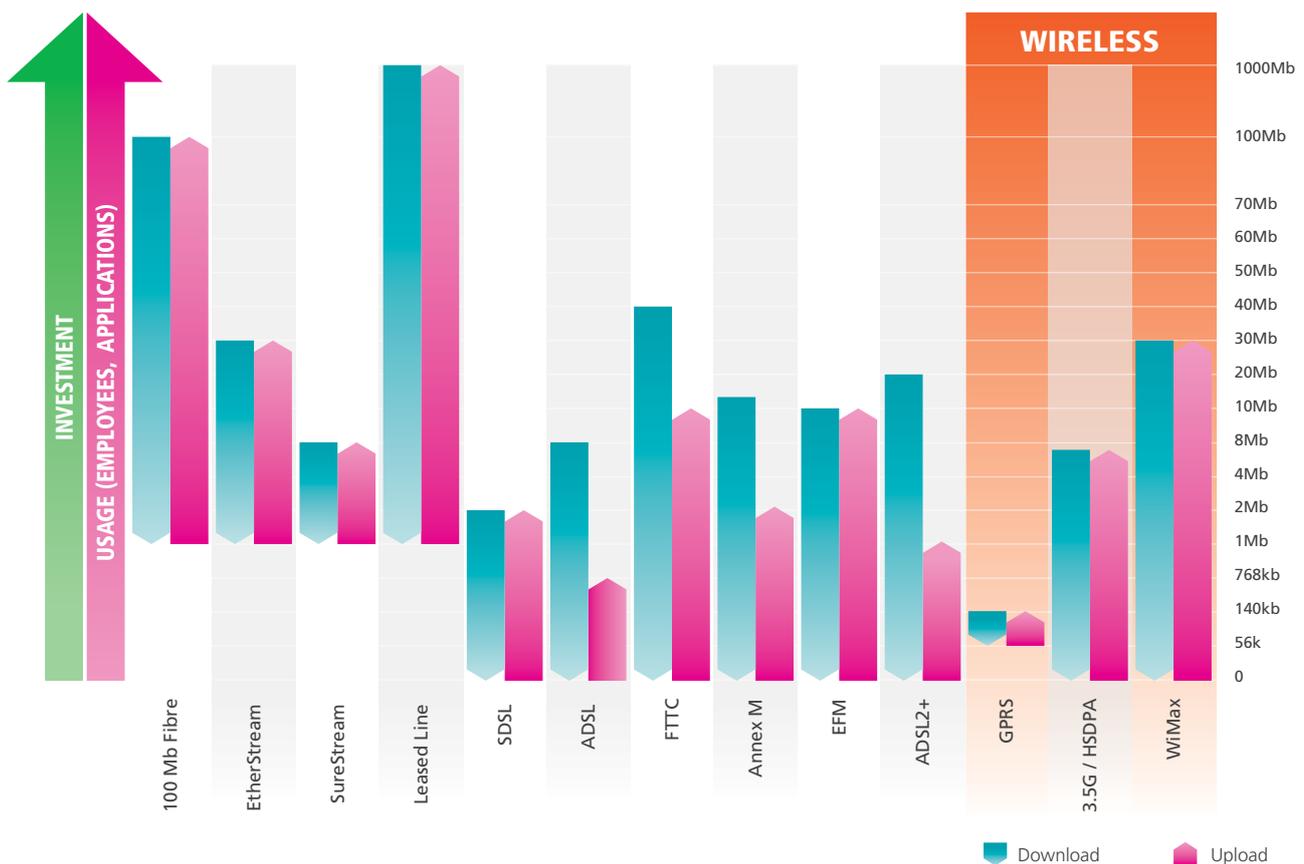
Fibre is not just about speed. It offers considerable benefits in terms of reliability, scalability and longevity. Fibre is inherently less susceptible to damp or interference, making it more reliable with less risk of business downtime.

The advantage of fibre is that it can be upgraded at a later stage. Even though today people may think of 100 Mbps as fast, future requirements may well demand even faster connections which could be provided over the same fibre connection. One day we are likely to be talking in gigabits as standard, rather than megabits.

Fibre not only meets business needs today, but can provide a truly future-proof service which can easily match the increasing need for business bandwidth.

But Fibre is not the only option open to businesses today.

In the figure below and product matrix, we have documented the latest fixed and mobile broadband offerings available in today's marketplace and attempted to de-mystified the jargon by simply displaying the technical specification and price band of each offering.



Access Types	Description	Price Band	Media	Private Network	Download speed	Upload speed	Contention ratio	BT exchange availability	Service Level	Installation time	Backup options	Recommended Router	NAT	Static IP addresses	Domains	DNS	SMTP Relay
100 Mb Fibre	One of the fastest Internet access products yet, delivering an uncontended, reliable and competitive service with speeds of 100Mb, 24x7 support and 99.9% service availability.	££££	Fibre	Y	100Mb	100Mb	1:1	Available from BT exchanges within the M25	99.9% guaranteed availability; 9 hour respond-and-repair time	40 working days installation pledge within the M25 (Longer lead time if area is not enabled.)	ADSL 2Mbps or 8 Mbps; SDSL 1 Mbps or 2Mbps	Cisco 2811	n/a	Unlimited	1	Yes	Yes
EtherStream	A premium Internet access product delivering resilient, uncontended (1:1 ratio) bandwidth from 2Mb to 40Mb, easily scalable, with 24x7 support and 99.9% service availability.	£££	Copper	Y	2Mb - 40Mb	2Mb - 40Mb	1:1	Up to 4.5km	99.9% guaranteed availability; 9 hour respond-and-repair time	Within 20 working days in an EtherStream-enabled area. (Longer lead time if area is not enabled.)	ADSL 2Mb or 8Mb; SDSL 1Mb or 2Mb	Actelis ML628 with a choice between Cisco 1800/2800 or OneAccess One20	N/A	Unlimited	1	Yes	Yes
SureStream	An advanced symmetrical access service delivering resilient, uncontended (1:1 ratio) bandwidth up to 8Mb, easily scalable, with 24x7 support and 99.9% service availability.	£££	Copper	Y	1Mb, 2Mb, 4Mb or 8Mb	1Mb, 2Mb, 4Mb or 8Mb	1:1	Up to 3Km	99.9% guaranteed availability; 9 hour respond-and-repair time	Within 30 working days	ADSL 2Mb; SDSL 1Mb or 2Mb	OneAccess One80M + One20 backup when required	N/A	Unlimited	1	Yes	Yes
Leased Line	Dedicated fibre access service with high availability guarantees and 24x7 support	££££	Fibre/Copper	Y	1Mb - 1000Mb	1Mb - 1000Mb	1:1	Up to 35km	99.9% guaranteed availability; 9 hour respond-and-repair time	Within either 45 working days or 75 working days, depending on type.	ADSL 2Mb or 8Mb; SDSL 1Mb or 2Mb	Choice between Cisco 1800/3800 or OneAccess One20	N/A	Unlimited	1	Yes	Yes
SDSL	SDSL (Symmetrical Digital Subscriber Line) -a widely available symmetrical broadband service, delivering up to 2Mb both upstream and downstream.	££	Copper	Y	Up to 2Mb	Up to 2Mb	5:1 or 10:1	Up to 3.5km	Standard Care is up to 5 days - Enhanced Care is 20 clock hours	Within 20 working days	Optional 128kb ISDN back-up circuit	OneAccess One20 or optional Cisco router at additional cost	Yes	POA	1	POA	POA
ADSL	ADSL (Asymmetrical Digital Subscriber Line)- a widely available asymmetrical broadband service, delivering bandwidth up to 8Mb	£	Copper	Y	Up to 8Mb	Up to 768kb	5:1 to 50:1	Up to 5km	Standard Care is up to 5 days - Enhanced Care is 20 clock hour	Within 15 working days	Optional 128kb ISDN back-up circuit	OneAccess One20 or optional Cisco router at additional cos	Yes	POA	1	POA	POA
ADSL2+	ADSL is being replaced by ADSL2 (also known as ITU G.992.3)- which is an ITU (International Telecommunication Union) standard. ADSL2 and ADSL2+ extend the capability of regular ADSL by doubling the number of downstream bits. This can lead to connection speeds of up to 24 Mb/s downstream and 1Mb/s upstream depending on the distance of the Exchange from the customer's premises.	£	Copper	Y	Up to 20Mb	Up to 1Mb	up to 1:1	Up to 5km (from 800 enabled Exchanges)	Standard Care is up to 5 days - Enhanced Care is 20 clock hour	Within 15 working days	Optional 128kb ISDN back-up circuit	Wide range of ADSL2 routers available	Yes	POA	POA	POA	POA

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ADSL (LLU)	Local loop unbundling (LLU or LLUB) is the regulatory process of allowing multiple telecommunications operators to use connections from the telephone exchange's central office to the customer's premises. The physical wire connection between customer and company is known as a "local loop", and it is owned by the incumbent local exchange carrier. To increase competition, other providers are granted unbundled access. This typically means cheaper basic services or LLU Provider specific services	£- ££	Copper	Y	Up to 40Mb	Up to 768kb	5:1 to 50:1	Up to 5km	Standard Care is up to 5 days - Enhanced Care is 20 clock hour	Within 15 working days	Optional 128kb ISDN back-up circuit	OneAccess One20 or optional Cisco router at additional cos	Yes	POA	1	POA	POA
FTTC	FTTC (Fibre To The Curb) uses the same ADSL2+ infrastructure but offers an End User Access based on the exchange equipment being located in the Street Cabinet . This End User Access provides a higher line rate of up to 40Mbit/s downstream and optionally up to 10Mbit/s upstream.	£	Copper	Y	Up to 40Mb	Up to 10Mb	up to 1:1	Up to 5km (from 132 enabled Exchanges)	Standard Care is up to 5 days - Enhanced Care is 20 clock hour	Within 15 working days	Optional 128kb ISDN back-up circuit	Wide range of lower cost Routers available	Yes	POA	POA	POA	POA
Annex M	As ADSL2+ but with the additional ability to trade off downstream for upstream	£	Copper	Y	Up to 12 Mb	Up to 2Mb	up to 1:1	Up to 5km (from 800 enabled Exchanges)	Standard Care is up to 5 days - Enhanced Care is 20 clock hour	Within 15 working days	Optional 128kb ISDN back-up circuit	Wide range of ADSL2 routers available	Yes	POA	POA	POA	POA
EFM	EFM (Ethernet in the First Mile) - a brand new and exciting lower cost option for Ethernet WAN access based on pre-existing and new copper lines rather than traditional fibre. Using new technology, services can be delivered via one to eight copper pairs depending on the speed required and distance from the exchange. This will provide competitively priced options for sites requiring between 2Mbps and 10Mbps, with services provided from over 600 POPs around the UK.	££	Copper	Y	Up to 10Mb	Up to 10Mb	1:1	Up to 5km (from 600 enabled Exchanges)	4 hour response time - 24 hour fix	within 25 working days	ADSL 2Mb; SDSL 1Mb or 2Mb	Cisco 1841	Yes	POA	POA	POA	POA
GPRS	Widely available 2.5G mobile data protocol used by GSM	£	Air-waves	Y	56kb to 140 kb	56kb to 140 kb	Shared	subject to Network Coverage	N/A	within 48 hours	n/a	Dongle or Router	Yes	POA	POA	POA	POA
3.5G / HS-DPA	Universal Mobile Telecommunications System (UMTS) is one of the third-generation (3G) mobile telecommunications technologies now becoming more widely available	£	Air-waves	Y	Up to 7.2MB	Up to 7.2MB	Shared	subject to Network Coverage	N/A	within 48 hours	n/a	Dongle or Router	Yes	POA	POA	POA	POA
WiMax	WiMAX, meaning Worldwide Interoperability for Microwave Access, is a telecommunications technology that provides fixed and fully mobile internet access using -largely dependent upon Line of Sight and weather conditions	£££	Micro-waves	Y	Up to 30Mb	Up to 30Mb	1:1	subject to planning permission and line of sight	99.50% availability	Within 10 days	n/a	Cisco 1800	Yes	POA	POA	POA	POA

What should you be thinking about when selecting your next access type?

Performance Factors - Speed / Upload / Download / Contention

Speed is usually key when selecting an internet connection, gauging the type of connection is also driven by factors such as

Best practices for tasks such as:

Nature of traffic traversing the link (small financial transactions vs rich media downloads ?)

Do your applications have specific requirements for upload and download speeds (the speed at which data travels to and from the internet – often governed by distance from the exchange)?

Contention (ISPs often share their capacity across users) will have an impact on performance . Uncontended or 1:1 is the best but this usually comes at a premium.

Acceptable Use Policy

Most Internet Service Providers (ISP) operate an Acceptable Use Policy (AUP).

If you intend to move large amounts of data, check that your connection has an appropriate usage allowance. Most lower level DSL products come with usage limits whilst higher level products such as Leased Lines are usually unmetered.

Bandwidth is a direct cost to an ISP and is carefully measured and allocated across their customer base . An acceptable or fair usage policy stops any one user using up the majority of bandwidth set aside for an internet provider thereby reducing the enjoyment of the service by their other customers. ISPs manage the usage of bandwidth by allocating an allowance to a particular internet connection. This allowance refers to the monthly limit that your ISP sets for the amount of data you can

upload or download (unless you are on an unlimited package). For example, you can download different amounts of data depending on what activity you are doing online.

Here is a guide that shows how different web uses affect the amount of data you use.

Average Broadband Usage

Speed	Use
20Kb	Text emails sent and received
50Kb	1 website page
3Mb	1 song
3Mb	1 video clip (3 minutes)
400Mb	1 film
56Kbps	the average bandwidth required for a single hosted SAP session
59Kbps	the average bandwidth required for a single hosted Salesforce.com session

Gb: Mb: Kb Conversions** 1Gb = 1024Mb and 1Mb = 1024Kb

Unlimited broadband?

There are a number of broadband packages on the market that advertise “unlimited downloads”. While this looks like the best deal going it is important to read the small print. However , if you study the contract terms closely you will find that most (if not all) unlimited broadband packages are subject to fair usage policies. Often broadband providers will notify heavy-users to warn them that speeds will be curtailed at certain times.

These policies mostly impact those who use Peer-to-Peer software as well as online gamers and people who download large volumes of songs and films.

Exceeding the download limits

Exceeding the download allowance of your broadband provider will incur a cost from some ISPs Other ISPs will not charge extra for extra downloads, but they may curb the speed of your connection.

SLA (Service Level Agreement) - Uptime guarantees, Time to Fix guarantees

How long can your business operate without internet access?



25% of SMEs say this figure is less than 1 hour!

(source: Quocirca 2010)

So clearly a robust and appropriate Service Level Agreement is in order, these are available and are directly linked to technology and cost. DSL products are supplied by default with Standard Care which provides for a target fix time of 5 days.

Resilience - Failover options

Recognising the potential limitations of Service Level Agreements at both ends of the technology spectrum, there are cost effective methods available to provide additional resilience, loadsharing or failover.

For example we can connect more than one basic DSL connection together in a failover or load sharing configuration.

Primary links can be backed up by links of similar specification – you could also think about using a different technology type for backup (e.g. 3G Mobile) . This will provide even greater diversity. Ask us to find out more.

QoS – Quality of service

Certain applications such as voice and video are more sensitive to the quality and performance of a network link. There are additional protocols that can be applied which allow you to assign priority over the different data types. For example, you would want voice to travel quicker than e-mail so certain connection types would allow you to “tag” the different types of traffic and prioritise accordingly.

Networking

Do you have a need to connect together more than one site, or perhaps link to a centralised Data Centre where your hosted applications reside. There are a variety of connection types available depending upon your requirement and budget. Solutions range from low cost Public Internet based networks up to more sophisticated private point-to-point connectivity.

Monitoring and Management

Simply having good physical connectivity is only half the story. Providers must add value by providing effective Monitoring and Management services. Monitoring provides you with proactive alerts whenever there are problems on your links (e.g. complete loss or degraded service) whilst Management can extend to support and configuration control of your hardware. Taking this hassle away frees up valuable time allowing you to get on with managing your business.

Security

As the number of applications and the diversity of access media have grown exponentially. Each service adds demands on performance and reliability, and exposes new areas of vulnerability and risk. There are managed firewall and hosted security solutions available that help minimise this risk.

Flexible Financing

Providers should offer flexible finance arrangements to suit clients individual budgetary requirements. For example some organisations prefer to spread project costs over monthly payments avoiding one-off capital expenditure.

What to do next ?

Get in contact with us and we will be happy to let you know what flavours of broadband are available at your location and provide you with an up to date quote of the options available.

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Glossary of Commonly Used Broadband Terms

Term	Description
21CN - 21st Century Network	BT's next generation network, which is being rolled out between 2007 and 2012.
Access Type	The type of broadband access you have to the internet (e.g ADSL or Leased Line)
ADSL - Asymmetric Digital Subscriber Line	This is the most common way in which broadband is delivered in the UK - using existing copper telephone lines.
ADSL2+ - Asymmetric Digital Subscriber Line, version 2+	A form of ADSL offering up to 24Mbps downloads, and up to 2.5Mbps upstream (for the Annex M version).
AP - Aggregation Point	The point at which broadband/voice traffic from multiple exchanges is aggregated in to a single point, ready for hand-off to a CP.
CP - Communications Provider	BT's terminology for an ISP
Contention	When two or more users share a circuit, there is a chance that they will both want to transfer data at the same time. Modern packet networks share bandwidth equally, meaning that all users get an equal share of the capacity. This is called contention. Broadband services have often been characterised by a contention ratio, which is the maximum number of users sharing the same circuit. The higher this ratio, the more unpredictable the connection performance. Residential service providers usually offer contention ratios of around 50:1. Business service providers offer contention ratios from 20:1 down to 1:1 (uncontended).
Download	This is the speed at which data travels from the internet to your own device.
DNS	Short for Domain Name System (or Service or Server), an Internet service that translates domain names into IP addresses. Because domain names are alphabetic, they're easier to remember. The Internet however, is really based on IP addresses. Every time you use a domain name, therefore, a DNS service must translate the name into the corresponding IP address. For example, the domain name www.example.com might translate to 198.105.232.4.
DPI - Deep Packet Inspection	The process by which a traffic analyser will look beyond the packet headers and down in to the packet payload in order to determine the type of traffic or other characteristics.
DSLAM - Digital Subscriber Line Access Multiplexer	The device installed in telephone exchanges that terminates copper pairs to provide xDSL connections. Superseded in 21CN by MSANs.
EP - Extension Path	The link between the APs and the MSILs.
EUA - End User Access	BT's terminology for the tail circuit from the exchange to the end users premises
FTTC - Fibre To The Curb	The process by which fibre optic cables are laid from the exchange to the curb (typically a street cabinet). Traditional copper connections then run from the street cabinet to the premises.
FTTP - Fibre To The Premises	Fibre optic cables delivering services directly to the premises from a local POP or telephone exchange.

Term	Description
GPRS	General packet radio service (GPRS) is a packet oriented mobile data service available to users of the 2G cellular communication systems global system for mobile communications (GSM), as well as in the 3G systems. In 2G systems, GPRS provides data rates of 56-114 kbit/s
GSM	GSM (Global System for Mobile Communications: originally from Groupe Spécial Mobile) is the most popular standard for mobile telephony systems in the world . It is also known as the 2G cellular communication system.
HSDPA	High-Speed Downlink Packet Access (HSDPA) is an enhanced 3G (third generation) mobile telephony communications protocol in the High-Speed Packet Access (HSPA) family, also coined 3.5G, 3G+ or turbo 3G, which allows networks based on Universal Mobile Telecommunications System (UMTS) to have higher data transfer speeds and capacity
IP - Internet Protocol	The most commonly used set of rules governing how information is sent over networks (not necessarily just the Internet).
ISDN - Integrated Services Digital Network	A means of transmitting voice and data at up to 64kbps per channel.
ISP - Internet Service Provider	A provider of internet access services (such as ADSL).
Leased Line	A dedicated link (usually Fibre) to the internet that comes with high performance and high availability.
LLU - Local Loop Unbundling	The BT Openreach product that allows ISPs to install their own equipment in telephone exchanges and just use the copper pair to premises.
Media	The physical connection type e.g. fibre or copper used to provide internet access.
MSAN - Multi Service Access Node	A single piece of equipment installed into exchanges that can provide telephony, ISDN and xDSL all in one package.
MSIL - Multi Service Interconnect Link	A new form of Ethernet backhaul for 21CN technologies. Speeds available at up to 1Gbps at present, with 10Gbps in the pipeline.
NAT	NAT (Network Address Translation or Network Address Translator) is the translation of an Internet Protocol address (IP address) used within one network to a different IP address known within another network. One network is designated the inside network and the other is the outside. Typically, a company maps its local inside network addresses to one or more global outside IP addresses and unmaps the global IP addresses on incoming packets back into local IP addresses. This helps ensure security since each outgoing or incoming request must go through a translation process that also offers the opportunity to qualify or authenticate the request or match it to a previous request. NAT also conserves on the number of global IP addresses that a company needs and it lets the company use a single IP address in its communication with the world.
NGN - Next Generation Network	The generic name given to a new breed to communications networks.
POP - Point of Presence	A site in which a communications provider hosts equipment for terminating connections.

Term	Description
QoS - Quality of Service	A measure of how "good" the service on a broadband connection is. Most QoS implementations allow you to define different priorities for different types of traffic (e.g. Web, VoIP, email)
SDSL - Symmetric Digital Subscriber Line	A DSL service in which the upstream and downstream channels operate at the same speed.
SMTP	Simple Message Transfer Protocol - used to manage delivery and receipt of e-mail
Upload	This is the speed at which data travels from your own device to the internet.
VoIP - Voice over IP	The generic name given to telephony services that communicate using IP rather than the old PSTN.
VP - Virtual Path	A virtual link of a predefined capacity carrying broadband traffic from the DSLAM in the telephone exchange back to the BT network.
WBBC - Wholesale Broadband Connect (old name)	Acronym replaced by WBC, since "WBBC" led to confusion with the BBC.
WBC - Wholesale Broadband Connect	BT's new wholesale broadband product, offering ADSL2+ and QoS services nationally.
WBCC - Wholesale Broadband Connect Converged	A combined voice and broadband product based upon WBC.
WBMC - Wholesale Broadband Managed Connect	An end-to-end version of WBC that simplifies management by handling traffic from all Aggregation Points.
WCA - Wholesale Converged Access (old name)	Product renamed and acronym subsequently changed to WBCC.