



# Broadband

A to Z of Broadband



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## 0-9

20CN	The 20th Century Network that is home to the ADSL Max (IP Stream) and SDSL products
21CN	The 21st Century Network that is home to WBC product family which includes ADS2+, Annex-M and FTTC

# A

ADSL	Asymmetric Digital Subscriber Line is the common name given to the type of technology that is used to provide an internet connection to the premises that is always on, this technology does not utilise the full capacity of an analogue line meaning that it is still possible to make voice calls over the line. Asymmetric refers to Downstream and Upstream speed and means that they are different values, a real world example of this is a standard ADSL2+ connection where typically the Downstream speed is 14meg and the Upstream speed is 1meg.
Analogue Signal	The type of signal that carries data down an Analogue line (PSTN Line). Analogue signals cannot be interpreted by a computer as they are digital which is why a Modem is needed (see Modem)
Annex-A	The short hand term for the ITU G.992.3 Annex A Standard commonly known as ADSL
Annex-M	The short hand term for the ITU G.992.5 Annex M Standard, like Annex-A this is another standard of ADSL but this focuses on Upstream rather than Downstream. In practise Annex-M can more than double the Upstream speed of the standard ADSL product.
ATM	Asynchronous Transfer Mode is a network technology based on transferring data in or packets of a fixed size.
Attenuation	Attenuation is a measure of the loss in power of electromagnetic signals between transmission and reception points. Many factors affect attenuation but by far the largest factor is line length. A real world example is the further you are away from the exchange the higher your attenuation figure will be as the signal loss increases. This is the greatest factor in determining the speed an Broadband product can achieve, in simple terms, the shorter the line is from the DSLAM (exchange) the faster it will be
Authentication	The term used to describe an end users Modem confirming it has the correct credentials (user name and password) to log in and utilise a broadband service, the credentials will be matched to a set of credentials stored on the Radius server.

## B

Bandwidth	The amount of data that can be transmitted in a fixed amount of time. For digital devices, the bandwidth is usually expressed in Mbit/s (megabit per second)
Bits-per Second (bps)	A measure of how fast data is transferred from one place to another
BRAS	Broadband Remote Access Server Profile is responsible for regulating the bandwidth available to IP Stream products on the 20CN network.
Broadband	A generic name given to products that allow you to access the internet, these products are always connected and do not utilise the whole capacity of a line (PSTN) which still allows for voice calls to be made, see ADSL, ADSL2+ and FTTC

# C

Contention Ratio	The ratio in which an internet connection is shared between multiple users at the exchange, a simplified explanation of this is that ultimately ADSL lines for multiple customer's all meet at the exchange at the DSLAM where the signals are combined and sent to the wider network (the internet) together, otherwise each exchange would need tens of thousands of connections to the internet which in practise would be impractical. Products with higher contention ratios will be subject to minor performance issues when the exchange is under load such as at peak times.
CD	Carrier Detection another term used for sync on certain brands of routers typically Cisco's, see Sync
CLI	Caller Line Identity is the telephone number displayed to the party who receives a call. This is the "telephone number" associated to a line and is used to differentiate between PSTN lines.
COA	Change of Address is the action of moving service from one premises/site to another.
Copper Line Test	A test used to determine if a PSTN is working correctly, a faulty PSTN line can cause intermittent or total loss of a broadband service.
CPE	Customer Premises Equipment is telecoms equipment belonging to the End User, e.g. Router/Modem, PBX, telephone, fax machine, etc.
CRC Error	Cyclic Redundancy Check is an error-detecting code commonly used in digital networks and storage devices to detect accidental changes to raw data. In practical terms it can be used to see how a line is performing, if you see a large number of CRC Errors it means the data that is being sent or received has been corrupted in transit and points to a fault on the line / equipment.
CRD	Customer Required by Date is the date by which an End User requires a broadband order to be completed by. It will usually default to Openreach's earliest lead time.

## D

DACS	<p>Digital Access &amp; Carrier System is when BT install phone lines they sometimes provision 2 lines down the same copper line in order to save space. This provides problems as Broadband requires a single dedicated line in order to work. When your order is placed the DACS will be highlighted and cause the order to be held in a delayed state. The solution to this is for a BT Engineer to visit your location and split this line by removing the DACS. When this has completed the order will resume.</p> <p>The location of the DACS determines the length of the delay and whether it can be removed. DACS can occur anywhere on the phone line, therefore once it has been located it will be removed. In some cases DACS will occur inside the customers premises, therefore an appointment will be made for a BT Engineer to visit the premises.</p>
Data Rate – See Bandwidth	
Default Gateway	See Gateway
DHCP	<p>Dynamic Host Control Protocol is a protocol for assigning dynamic IP addresses to devices on a network. With dynamic addressing, a device can have a different IP address every time it connects to the network. Dynamic addressing simplifies network administration because the software keeps track of IP addresses rather than requiring an administrator to manage the task. This means that a new computer can be added to a network without the hassle of manually assigning it a unique IP address.</p>
DLM	<p>Dynamic Line Management (or DLM) is a collective term for the systems used by BT to stabilise ADSL services. It automatically logs information on a line's performance and takes steps to stabilise the line. It can do this by applying Interleaving, and/or reducing the maximum speed a line can connect at. DLM should result in a stable service being established over the first five days (Training Period) after receiving your broadband service. During this training period disconnections may be experienced when changes in line speeds occur.</p>
DNS	<p>Domain Name System is the system whereby Internet domain names are located and translated into Internet Protocol (IP) addresses. In practical terms it can be likened to a telephone directory in that can convert a name into a number that in turn is used to provide a method of contact between two or more parties, when you enter a domain into your browser for example <a href="http://www.google.co.uk">www.google.co.uk</a> the DNS server will look up the IP address of the domain and route your traffic to and from that IP address.</p>



Downstream / Download	The transmission of packets (data) from a server or the internet towards an end user usually expressed in Mbit/s (megabit per second).
DP	Distribution Point is the point at which telephone lines are taken from a bundle to a premises.
DSL	Digital Subscriber Line is a technology enabling very high speed information transfer over ordinary telephone lines, see ADSL
DSLAM	Digital Subscriber Line Access Multiplexer is the hardware at a phone company's central location that links many customer DSL connections to a single high-speed line. For ADSL connections this is found in the exchange but for FTTC its found in the green cabinets that the copper leg of the line connects to in the street.

# E

EFM	Ethernet for the First Mile is part of the Ethernet family of computer network protocols between a telecommunications company and a customer's premise. From the customer's point of view it is their "first" mile, although from the access networks' point of view it is known as the "last mile". EFM can deliver symmetrical speeds and is much more resilient than the standard ADSL or FTTC products.
Exchange	A telephone exchange is a centralised location housing telecommunications and broadband equipment that interconnect (switch) telephone subscriber lines to establish telephone calls between the subscribers and control and manage broadband signals to the internet.
Error	A common term used to describe a corrupted or damaged packet of data

# F

FUP	Fair Usage Policy is the amount of bandwidth an end user can use before they get charged for any additional bandwidth they use, for example, if an end user pays for 50gig any bandwidth they use outside of this allowance will constitute a breach of the fair usage policy and as such they will be charged a flat rate per GB
FTR	Fault Threshold Rate (or FTR) is 80% of the maximum stable rate (or MSR). If the line rate drops below the FTR for more than 8 hours in a week period it is considered a fault and a low threshold breach fault can be raised.
Firewall	<p>A piece of security hardware or software that prevents unauthorised users from accessing private networks connected to the Internet.</p> <p>Firewalls separate computers from the Internet and check packets of data as they arrive in to the Firewall or out of the computer to decide if they should be allowed to enter or be blocked if they do not meet the stated security criteria</p>
FTTC	Fibre to the Cabinet is a term for a broadband connection using optical fibre to replace part of the usual metal local loop used for connection to an exchange. With FTTC the optical fibre replaces the copper from the DP (street cabinet) to the exchange, in practise this allows for much higher speeds as the length of the copper is much shorter (see Attenuation) and also boasts increased stability over its ADSL counterpart. With FTTC the DLSAM is located in the cabinet rather than the exchange.

# G

Gateway	A connection point to an external network, in most scenarios this would be the Internet. Commonly when setting up a router you will see what's called the Default Gateway which relates to the IP address assigned to the internal facing side of the router which is the connection between the router and a network device such as a Personal Computer.
G.DMT	This is the Discrete Multi-tone standard that modems have to adhere to for ADSL capability.
GB	Gigabyte is equivalent to about 1 billion Bytes, this is commonly the largest denominator used when looking at traffic that has passed over a broadband connection and is the denominator used when selecting a broadband package as per its fair usage policy

# H

HEC Error	Header Error Control is a type of CRC error check which has been performed on the header of an ATM packet, but 1 bit errors can be corrected. This count is usually where HECs have been uncorrected and have been discarded. If these errors are too high within a short period of time it will slow throughput and could even lead to connection instability
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Interleaving	<p>Interleaving provides error correction on lines. It is used to stabilise a line at higher speeds by providing additional information which is used to fix problems caused by errors occurring on the line.</p> <p>Interleaving can result in higher latency (ping), which can affect VOIP Traffic. Interleaving is automatically applied if BT's DLM systems determine it is necessary to maintain a higher speed or stable connection. An option is available to disable it if it affects the customer's ability to maintain functional VOIP traffic and use other latency-sensitive applications. The interleaving value is denoted by the prefix INP which can be seen on the line profile.</p>
IP Address	<p>Internet Protocol Address is a unique number identifying the location of your computer on the Internet, enabling it to communicate with other computers, e.g. 188.449.8.623. Computers use IP addresses to locate and talk to each other on the Internet, much the same way people use phone numbers to locate and talk to one another on the telephone. When you want to access a Web site, your computer asks a domain name system (see DNS) server for the IP address and your computer uses the answer it receives to connect you to your required Web site or server.</p>
IP Stream	<p>This is the BT service on which enabled exchanges provide end users an ADSL connection to the 20CN network. It allows for downstream line rates of up to 8192kbps, and upstream line rates of up to 832kbps depending on line length (see Attenuation).</p>
ISDN	<p>Integrated Services Digital Network. With the rapid development and growth of VOIP and high speed broadband connections this is soon to be regarded as a legacy product but fundamentally has been providing small to medium sized businesses with a service provided by most telephone carriers that enables the transmission of voice and data.</p>
ISP	<p>Internet Service Provider is a company / organisation that provides broadband access to the internet</p>

# J

JDSU	A company that specialise in manufacturing the testing equipment used by SFI Engineers when testing a PSTN line when in fault, the name of the test equipment takes the company name and is referred to as a JDSU.
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# K

KCI	Keeping the Customer Informed are alerts sent from Openreach to keep you informed of progress and updates on faults and orders for both PSTN and Broadband products.
KBD	Knowledge Based Diagnostics is a tool utilised by support desks to diagnose faults on both the 20CN and 21CN network. The advanced diagnostics page on the Gamma Portal runs a KBD in the background and pulls the data from this diagnostics platform and displays it in a well formatted manner to enable Partners and Gamma Staff to diagnose issues with a service.
Kbit/s	kilobits per second ia a measure of how fast data is transferred from one place to another



# L

LAN	Local Area Network is a high speed network that connects computers, printers and other network devices together.
Latency	Latency is the amount of time a message takes to traverse a system. In a computer network, it is an expression of how much time it takes for a packet of data to get from one designated point to another. It is sometimes measured as the time required for a packet to be returned to its sender which is known as Ping.
Line Box	A standard BT socket
Line Plant	The external Openreach network consists of a series of cables, wires, and fibre optic links that connect residential and business premises to the local telephone exchanges. Collectively these are known as "line plant" (or the 'access network', or the 'local loop')
Line Rate	See Sync
LLU	Local Loop Unbundling is the process where the incumbent operator (Openreach) makes its local network (the copper cables that run from customers premises to the telephone exchange) available to other companies. Operators are then able to install their own equipment allowing them to provide their own services direct to their customers.
Local Loop	The part of the public switched telephone network (see PSTN) which connects subscribers' equipment with the nearest local telephone exchange.
Loop Loss	See Attenuation

# M

Mail Server	A computer that receives e-mail messages and sends them to the right addresses.
Master Socket	The main socket that for you PSTN line. This is normally found at the PSTN lines point of entry to the property. All extensions will run from this socket to other sockets within a premises.
MB (Megabyte)	Equivalent to about 1 million Bytes.
Microfilter	A small device used to split the telephone and broadband signal from a wall socket. Without these being placed on every socket that's in use when a telephone call is made or received its likely to drop the sync of the broadband connection, faulty filters can also cause a broadband connection to error.
Migration	The movement of a broadband service between providers, normally incurs minimal downtime and no engineering work at the end users property unless they are also regrading the service.
Modem	Short for MOdulator-DEModulator. A modem is a device or program that enables a computer to transmit data over, for example, telephone or cable lines. Computer information is stored digitally, whereas information transmitted over telephone lines is transmitted in the form of analogue waves. A modem converts between these two forms.
Modulation	Modulation refers to the way the broadband signal is sent and received. Different broadband products use different modulation for example ADSL, ADSL2+ and Annex-M. You can configure a network device to use a specific type of modulation but its most common to use the "Auto" option whereby the equipment will detect the modulation in use at the time and configure itself to work to that standard.
MSR	Maximum Stable Rate is a line rate threshold established by BT over the first 10 days of service on your broadband service. It is used to determine when a drop in line rate would be considered a fault. Once an MSR is established BT will accept a fault report if the line rate drops by 20% or more.

# N

NAT	Network Address Translation is a method of connecting to the Internet using just one IP address. The NAT system is set up as a way of only using one public-facing IP address, giving any machines or devices connected to the Internet behind this a private address. This is accessible only to other devices on the same network. The opposite of this is a Routed IP solution (see Routed IP)
Network	A system which enables computers to connect together to share information and access hardware and printers. Commonly you can split this into two categories which are WAN (see WAN) or LAN (see LAN)
Noise Level / Margin	Noise level, also known as Noise Margin refers to the level of background noise on a telephone line and differs depending upon the characteristics of that line e.g. short/long line, good/low quality copper. The lower the noise level, the better the quality of line, and theoretically enabling faster services to be delivered on it.
NTE	Network Termination Equipment is installed at a customer's premises that the incoming lines are connected to commonly referred to as the Master Socket. The NTE provides the customer with a means to connect to the PSTN line.
NoT	Notification of Transfer, this has replaced the MAC process and is the process used when you want to transfer your circuit to another ISP.



Openreach	A separate entity from BT that still retains the BT logo, Openreach own the 20CN and 21CN network and are responsible for maintenance on those networks, when an end user has a fault it will be an Openreach engineer (see SFI) that is dispatched to resolve the issue.
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# P

POP3	A protocol used by email clients for receiving email
Packet Loss	Packet loss occurs when one or more packets of data travelling across a computer network fail to reach their destination. Packet loss can be caused by a number of factors including signal degradation over the network, packet drop because of channel congestion or corrupted packets rejected in-transit. Lost or dropped packets can result in highly noticeable performance issues for VOIP services, video streaming, downloads and browsing experience.
Pairs	A cable composed of two small insulated conductors twisted together without a common covering. Also known as copper pair.
Ping	Ping is a computer network administration software utility used to test the reachability of a host on an Internet Protocol (IP) network. It measures the round-trip time for messages sent from the originating host to a destination computer that are echoed back to the source
PPP	Point to Point Protocol is the most common protocol used to connect home computers to the Internet over regular phone lines.
PPPoA	Point to Point Protocol over Asynchronous Transfer Mode relies on two widely accepted standards, PPP and ATM. It is an ADSL architecture, IP packets travel from the PC over Ethernet to the DSL modem, called the ADSL transceiver unit-remote (most commonly a Modem). The Modem adds the PPP protocol to the IP packets and transports them to the carrier's DSLAM via ATM.
PPPoE	Point to Point Protocol over Ethernet relies on two widely accepted standards, PPP and Ethernet. PPPoE is a specification for connecting the users on an Ethernet to the Internet through a common broadband medium, such as a single DSL line, wireless device or cable modem. All the users over the Ethernet share a common connection, so the Ethernet principles supporting multiple users in a LAN combine with the principles of PPP, this is mostly commonly seen in the connection between an FTTC Router and Modem.
Profile	Most broadband services use a profile, a profile outlines the parameters in which a broadband service will operate with regards to Sync speed, Interleaving and SNR.
Protocol	An agreed-upon format for transmitting data between two devices.
Provision	The term used to describe adding a broadband service to a PSTN line.
PSTN	Public Switched Telephone Network is the name given to a standard copper telephone line.

## Q

QoS	Quality Of Service refers to several related aspects of telephony and computer networks that allow the transport of traffic with special requirements. In practical terms it is commonly found as a setting on a router that is used to prioritise certain types of traffic over an internal network being transmitted to the internet. An example of this would be to prevent over utilisation (see Utilisation) issues when using a converged service to provide standard data services and VOIP traffic over the same connection.
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# R

Rate Adaptive	IP Stream Max/Max Premium are referred to as a 'Rate Adaptive' services - this means the service will change the line rate based upon line conditions, which can vary over time. Due to fluctuations in line quality a line could Rate Adapt from a higher speed during the day to a lower speed at night.
Radius	A server used to control the log in information for end users, the Radius also notes the bandwidth used by an end user and there Session times.
Regrade	The term given to an order that changes a broadband service, common examples of regrades would be to increase a connection from 8meg to 24meg or from ADSL to FTTC. Regrades are not always to increase speed or to move to a better technology type, its common to regrade a connection to ADSL from ADSL2+ if the line is very long and the end user is having stability issues.
REIN	Repetitive Electrical Impulse Noise is when interference from an external power source interferes with the ADSL signal. Usually the two should coincide happily and cause no problems, however on occasions an electrical item can introduce additional noise in the same band of frequencies utilised by DSL. This noise then degrades the ADSL signal, either causing degradation of achievable speed due to a build up of errors or loss of synchronisation with the exchange.
RIPE	An Internet registry that supplies and administers IP addresses
Routed IP	A publicly assessable IP address which is the converse of NAT. Routed IP addresses are commonly used to internal networks to assign to devices that could conflict for example mail servers or a PBX.
Router	A network device that splits an internet connection several ways and routes the connections over Ethernet leads or via wireless.

# S

SDSL	Symmetric Digital Subscriber Line is a version of DSL where the upload and download speeds are the same (Symmetric)
Server	See Web Server and Mail Server
Session	The amount of time a user remains online measured from when they first connect to the Radius server until they loose connection.
SFI	Special Faults Investigation is the name given to the type of engineer sent by Openreach to find and fix a broadband service that is in fault.
SHINE	Single Isolated Impulse Noise is similar to REIN but where the interference is generated as a burst typically when a device is powered on or off. As a result disconnections or line errors may result at the time a device is switched on or off.
Simultaneous Provide	The name given to an order where a broadband service will be activated on the same day as a PSTN line will is installed, this type of order requires a Simultaneous Provide Key / Code which will be issued by the PSTN provider when the place the PSTN order.
SMTP	Simple Mail Transfer Protocol is the main protocol used to send electronic mail from server to server on the Internet. SMTP is a protocol for transferring e-mail across the Internet. You send e-mail with SMTP and a mail handler receives it on your recipient's behalf. Then the mail is read using POP3 or IMAP.
SNR	Signal to Noise Ratio is a measurement in decibels of the Signal strength to the level of Noise on the line. The higher your SNR is, the better, as there is less background noise.
Splitter	See Microfilter
Static IP	The IP address assigned to a router when it gains Authentication. This IP address will always be the same for the duration of the broadband service unless it is specifically requested to be changed by the ISP
Sync	The connection and speed to which an end users network equipment connects to the telephone exchange. Commonly denoted on routers as DSL, Broadband or CD. The Sync speed will vary depending on the length of the line and the quality of the copper and will determine the maximum throughput available.



# T

TCP / IP	<p>Transmission Control Protocol / Internet Protocol is the basic communication language or protocol of the Internet.</p> <p>TCP / IP is a two-layer program. Transmission Control Protocol assembles the message / file into smaller packets that are transmitted over the Internet and then reassembled into the original message. Internet Protocol ensures each packet gets to the right destination.</p>
Throughput	<p>The measurement in actual speed the broadband service can achieve at any one point in time. The throughput should be equal to around 90% of the Sync speed when the broadband service is performing correctly.</p>
Training period	<p>see DLM</p>
TRC	<p>Time Related Charges are charges applied when an engineer must spend extra time to complete a piece of work. They are generally connected with fault repair work as opposed to provisioning charges.</p>

# U

Upstream / Upload	The transmission of packets (data) from an end user to a server or the internet usually expressed in Mbit/s (megabit per second)
Utilisation	Utilisation refers to how much of the capacity (Bandwidth) of the line is utilised at any one point in time. A common use of this term is “over utilisation” which is common when using one broadband connection to carry both standard traffic such as web browsing, email, video steaming etc. with VOIP data for calls. Where a line is being over utilised if QoS (see QoS) is not properly configured and managed you will see degradation in VOIP calls. This is because a broadband connection can only pass data at a rate limited by its bandwidth, if a line is using all its bandwidth and calls are being made the packets of data used for calls can be delayed or even dropped meaning poor voice quality and premature termination of calls.

# V

VOIP	Voice over IP is hardware and software that enables people to use the Internet to make telephone calls by sending voice data in packets using IP rather than by traditional methods.
VPI / VCI	Virtual Path Identifier / Virtual Channel Identifier settings define how the modem sets up the connection. VPI is an eight-bit field and VCI is a 16bit field in an ATM packets header that identifies the packets next destination as it travels through an ATM network. An ATM switch uses either the VPI, the VCI, or a combination of both to route the packet to its destination. Standard VPI / VCI settings for Gamma customers are 0 / 38 respectively.
VPN	Virtual Private Network's are used to connect remote offices together (LAN to LAN) and provide access for remote workers who are away from the office. Its key to note that VPN's are not supported on the Gamma Assured service.

## W



WAN	Wide Area Network is a network that covers a broad area for example any network that links across metropolitan, regional, or national boundaries. The most common example of this would be the internet.
WBC	Wholesale Broadband Connect is another term given to any broadband connection that runs over the BT Wholesale 21CN network.
Web Server	A computer that delivers Web pages. Your browser will form a connection to a Web server so that you can request pages from the internet and receive them on your computer.
Wireless Broadband	Wireless is a form of signal transmission that does not need a wired connection. This is a standard function on most routers and is commonly used to transmit a network connection to network devices that are enabled to receive wireless connections for example laptops or smart phones.

# XYZ



# Feedback



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