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A

100BaseT

Also called Fast Ethernet, it is a high-speed version of Ethernet (IEEE 802.3u standard). 100BaseT transmits at 100 Mbps rather than 10 Mbps. Like regular Ethernet, Fast Ethernet is a shared media LAN. All nodes share the 100 Mbps bandwidth. 100BaseT uses the same CSMA/CD access method as regular Ethernet with some modification. Three cabling variations are provided. 100BaseTX uses two pairs of Category 5 UTP, 100BaseT4 uses four pairs of Category 3, and 100BaseFX uses multimode optical fibers and is primarily intended for backbone use.

10BaseT

An Ethernet standard that uses twisted wire pairs (telephone wire). All stations connect in a star configuration to a central hub, also known as a multiport repeater. 10BaseT is widely used due to the lower cost and flexibility of installing twisted pair.

Access Code – short numbers beginning with 1 which enable callers to reach services provided on telecoms networks (eg 192 for directory enquiries) or to select a choice of carrier.

Access control services – the services which third parties require in order to use the system to offer interactive services.

Accounting Rate – the per-minute charge agreed by the two parties at each end of an international route at which traffic will be charged. Denominated in SDRs.

ACD

(Automatic Call Distributor) A computerized phone system that routes incoming telephone calls to the next available operator or agent. ACDs are the electronic heart of call centers, which are widely used in telephone sales and service departments of all organizations. The ACD responds to the caller with a voice menu and connects the call to an appropriate individual.

ADSL – see Asymmetric Digital Subscriber Line

ADT

(Asynchronous Data Transfer) A transmission technique used in ISDN PBXs that dynamically allocates bandwidth.

Adaptive routing

The ability to select a new communications path to get around heavy traffic or a node or circuit failure.

AMPS

(Advanced Mobile Phone Service) The analog cellular mobile phone system in North and South America and more than 35 other countries. It uses the FDMA transmission technology. AMPS is the cellular equivalent of POTS.

Amplitude

The strength or volume of a signal, usually measured in decibels.

Analogue – the direct representation of a waveform, as opposed to digital which is a coded representation.

Analogue mobile – the original cellular systems of the type used by Vodafone and Cellnet ie Total Access Communications System (TACS) and Extended Total Access Communications System (ETACS).

ANSI

(American National Standards Institute, New York, www.ansi.org) A membership organization founded in 1918 that coordinates the development of U.S. voluntary national standards in both the private and public sectors. It is the U.S. member body to ISO and IEC. Information technology standards pertain to programming languages, EDI, telecommunications and

Aplio/Phone

An Internet telephony appliance from Aplio, Inc., San Bruno, CA, (www.aplio.com) that requires the device at both ends of the call. A call is first made via the PSTN. Then the phones hang up and dial up their respective ISPs. Using Aplio's own directory servers, the connection is established via the Internet. For predetermined calls, the initial PSTN call is not necessary.

Application layer

The software in the OSI protocol stack (layer 7 of 7) that provides the starting point of the communications session.

Application Programme Interface (API) – software in the receiver which interprets a set of commands telling it, for instance, where to display a graphic or other object on the screen. The API also allows the same applications to run on different receiver designs without the need for the application to be rewritten for each one.

ARM chips

A family of RISC-based microprocessors and microcontrollers from Advanced RISC Machines, Los Gatos, CA, (www.arm.com). ARM chips are high-speed CPUs that are known for their small die size and low power requirements. They are widely used in PDAs and other hand-held devices, including games and phones, as well as a large variety of consumer products.

Asymmetric Digital Subscriber Line (ADSL) – (also known as xDSL) a technology that allows the use of a copper line to send a large quantity of data (eg a television picture) in one direction and a small quantity (eg a control channel and a telephone call) in the other..

ATM – Asynchronous Transfer Mode – the internationally agreed basis for broadband ISDN. A technology that enables all types of information (data, voice and video in any combination) to be transported by a single network infrastructure.

AT&T

(American Telephone & Telegraph Company, New York, www.att.com) The largest long distance carrier in the U.S. It was founded in 1885 and was once the largest corporation in America. On January 1, 1984, it was relieved of its operating telephone companies by Federal court order. AT&T has gone through a major change from the world's largest monopoly to a competitive enterprise. Its early ventures into the PC market were modest, but in 1991, AT&T acquired NCR, a seasoned

B

Background noise

An extraneous signal that has crept into a line, channel or circuit.

Backhaul – the link from the cablehead to (usually) the International Switching Centre

Bandwidth – the physical characteristic of a telecommunications system that indicates the speed at which information can be transferred. In analogue systems, it is measured in cycles per second (Hertz) and in digital systems in binary bits per second. (Bit/s).

Barriers to Entry – an additional cost which must be borne by entrants but not by firms already in the industry; or other factors, which enable an incumbent to maintain prices above the competitive level without inducing entry.

Baseband

A communications technique in which digital signals are placed onto the transmission line without change in modulation. It is usually limited to a few miles and does not require the complex modems used in broadband transmission. Common baseband LAN techniques are token passing ring (Token Ring) and CSMA/CD (Ethernet).

Basic channels – traditionally these were the channels which all TV subscribers received as part of the basic package. The term is increasingly being used to describe non-premium channels,. These are predominantly general news and entertainment channels. See also premium channels

Basic frame relay – a packet data communications service providing a signalling and data transfer mechanism between endpoints of the public network. Frames are routed by the network on permanent virtual circuits according to address information embedded in the frames.

Basic SMDS – a high-speed connectionless data service which provides access to BT's SMDS network, currently at access class rates up to 25Mbit/s.

Basic X.25 – a layer 3 packet data communications service which provides access to an X.25 public switched network where the access circuit is a permanent or continuous link to the network from the customer's premises.

Bell 103

An AT&T standard for asynchronous 300 bps full-duplex modems using FSK modulation

Bell 113

An AT&T standard for asynchronous 300 bps full-duplex modems using FSK modulation on dial-up lines. The 113A can originate but not answer calls, while the 113D can answer but not originate.

Bell 201

An AT&T standard for synchronous 2400 bps full-duplex modems using DPSK modulation. Bell 201B was originally designed for dial-up lines and later for leased lines. Bell 201C was designed for half-duplex operation over dial-up lines.

Bell 202

An AT&T standard for asynchronous 1800 bps full-duplex modems using DPSK modulation over four-wire leased

Broadband – a service or connection allowing a considerable amount of information to be conveyed, such as television pictures. Generally defined as a bandwidth > 2Mbit/s

Broadband Cable licence – a licence that authorises the installation of an applicable cabled telecommunications system to convey messages comprising entertainment services and specified public telecommunications services within a specified area. Due to changes in the Broadcasting Act licensing regime this type of licence has not been issued since 1994.

Broadband Switched Mass Market Services – services aimed at a mass market delivered over broadband switched telecoms networks.

Bundling – the tying of one service or product to the supply of others including some situations where the supply of services are linked through the use of discounts.

C

C7 – a modern signalling system, based on standards set by the CCITT (the former name of the world telecommunications standards-making body), for the transfer of messages between entities in telecommunications networks that enables the setting up, routing and clearing of calls and the transfer of other relevant information related to the operation of these networks. The C7 signalling system is used for the transfer of such messages between different networks as well as within individual networks.

Cablehead – the point at which the international cable arrives and terminates. Also known as cable landing station

Cable categories

The following categories are based on their transmission capacity. The majority of new wiring installations use Category 5 UTP wire in order to be able to run or upgrade to the faster network technologies that will require it. Categories 1 through 5 are based on the EIA/TIA-568

Cable modem

A modem used to connect a computer to a cable TV service that provides Internet access. Cable modems can dramatically increase the bandwidth between the user's computer and the Internet service provider. Most cable modems link to an Ethernet adapter in the PC making the service online all the time; however, the bandwidth will vary depending on how many customers are using the Web at the same time.

Call barring – specified numbers or ranges which cannot be dialled

Call diversion – call is re-routed to another number

Call Divert Service – a network service that allows a customer to have a network redirect incoming calls to another number.

Call routing apparatus – any equipment capable of switching two-way live speech telephone calls between two or more exchange lines and two or more extensions, such as PBXs, Automatic Call Distribution equipment and key telephone systems.

Calling Line Identity (CLI) – a facility that enables identification of the number from which a call is being made.

CATV – Community Antenna Television, Cable Television

CCA – Cable Communication Association – Trade body for cable companies.

CDMA – Code Division Multiple Access

Cell switch

A network device that switches fixed packets, such as an ATM switch.

CENTREX

PBX services provided by a local telephone company. Switching is done in the telephone company's central office. Some services do the switching at the customer's site, but control it in the central office.

Circuit/path resilience – the ability of the network to re-route a circuit over a different physical path when the original path becomes unusable for whatever reason.

Cisco

(Cisco Systems, Inc., San Jose, CA, www.cisco.com) A leading manufacturer of networking equipment, including routers, bridges, frame switches and ATM switches, dial-up access servers and network management software. Cisco was founded in 1984 by Leonard Bosack and Sandra Lerner, a married couple both employed by Stanford University. Initially targeting universities, it sold its first router in 1986. It now makes \$32m per day from the Internet.

Class 4 switch

A network device used by a long distance carrier (IXC) that switches calls. Unlike Class 5 switches that deal with two and four-wire lines, Class 4 switches deal only with four-wire (T1, T3, OC3, etc.). Echo cancellers are typically put on every port of a Class 4 switch.

Class licence – a licence granted by the Secretary of State to a class of people which permits any within the relevant class to provide specified services without the need for an individual licence or, in certain circumstances, the need to register the system or provide the service.

Coaxial cable

A high-capacity cable used in communications and video, commonly called co-ax. It contains an insulated solid or stranded wire surrounded by a solid or braided metallic shield, wrapped in a plastic cover. Fire-safe teflon coating is optional.

Communications Act

The establishment of the Federal Communications Commission (FCC) in 1934, the regulatory body for interstate and foreign telecommunications. Its mission is to provide high-quality services at reasonable cost to everyone in the U.S. on a nondiscriminatory basis.

Concentrator – the part the local exchange which is positioned close to the customers. It is sometimes within the local exchange, and sometimes located remote from the local exchange.

Copper line – the main transmission medium used in telephony networks to connect a telephone or other apparatus to the local exchange. Copper lines have relatively narrow bandwidth and so have limited ability to carry broadband services such as video unless combined with an enabling technology such as ADSL.

Core database – term to describe a database which includes aggregated directory information from different telecommunications companies.

Country code – the combination of 1, 2 or 3 digits characterizing the called country. Or see below.

Country code

A two-character component of an e-mail or Web address that identifies a country. Computers read addresses from right to left. Thus, on encountering sven@univ.oslo.net.se, the message would first be sent to Sweden, since se is the country code for Sweden. Swedish routers would then send the message to univ.oslo.net where it will be waiting for Sven the next time he signs on.

Crosstalk – the phenomenon whereby telecommunications signals on one circuit can leak across to another, potentially degrading the performance on the affected circuit.

Customernetwork interface – where a public telecommunications network is connected to a customers network or apparatus (at the Network Terminating Point) the network and the customers system must each be able to understand the technical operation of the other in order for services to interoperate across the connection boundary. The customers system and the network must both provide an interface at the point of connection and only where these interfaces are matched will there be interoperability. The technical characteristics that allow for that understanding is the customernetwork interface.

Customer Premises Equipment (CPE) – sometimes referred to as customer apparatus or consumer equipment, being equipment on consumers– premises which is not part of the public telecommunications network and which is directly or indirectly attached to it.

D

D/A converter

(Digital/Analog converter) A device that converts digital pulses into analog signals. Contrast with A/D converter.

D-AMPS

(Digital-Advanced Mobile Phone Service) The digital equivalent of the analog cellular phone service. Using the TDMA digital technology, analog cellphone systems can be upgraded to D-AMPS.

D1

A broadcast-quality digital video format that provides the highest quality recording, using expensive tape decks and metal-particle tape. D1 is a component format at 720x486 resolution and 24-bit color. It is raw, uncompressed digital video that uses 1MB of storage for each frame. At 30 frames per second, it requires a 30MB/sec transfer rate and nearly two gigabytes of storage per minute.

Data Network Identification Codes – codes allocated from the Numbering Scheme which allow for the routing of data services over telecommunications networks

DBS – Direct Broadcast to the home by Satellite.

DCE

(1) (Data Communications Equipment or Data Circuit-terminating Equipment) A device that establishes, maintains and terminates a session on a network. It may also convert signals for transmission. It is typically the modem.

DCS – 1800 Digital Cellular System at 1800 MHz

Dial-up connectivity – connections made to a data network using the switched network to provide a voiceband or data bearer.

Digital – the coded representation of a waveform by, for example, binary digits in the form of pulses of light, as opposed to analogue which is the direct representation of a waveform.

Digital Audio Visual Council (DAVIC) – a world consensus forum set up to generate global digital telecommunications standards in the area of broadband switched mass-marked networks and services.

Digital European Cordless Telecommunications (DECT) – a system for office cordless networks and suitable for more general cordless use including Telepoint type networks.

Digital Junction Switching Unit (DJSU) – similar to DMSU (see below) but used mainly for connecting calls around major conurbations.

Digital Local Exchange (DLE) – the telephone exchange to which customers are directly connected.

Digital Main Switching Unit (DMSU) – a trunk exchange primarily used for connecting long distance calls.

Digital PBX

(digital Private Branch Exchange) A modern PBX that uses digital methods for switching in contrast to older PBXs that use analog methods.

Digital technology – this enables information of all types to be transmitted in digital form over networks – it is faster than analogue systems.

Digital Video Broadcasting (DVB) Project – a European consensus group, with experts from 140 organisations representing broadcasters, administrations, manufacturers and network providers, which proposes solutions to technical and commercial issues affecting video broadcasting using digital techniques.

Digitalization – the process of converting information in analogue form into digital form.

Direct Access – the situation where a customer is directly connected to a telecommunications operator by a wire, fibre–optic or radio link to connect that customer to the public telecommunication network.

DISC – Digital International Switching Centre

Distribution networks – the network over which signals and messages are transmitted eg a telephony or cable TV network, or a terrestrial or satellite TV broadcast network.

DQR – a directory status classification whereby the customer’s directory information is available from directory enquiry services but is not included in the phone book.

DSL

(Digital Subscriber Line) A modem technology that increases the digital speed of ordinary telephone lines by a substantial factor over common V.34 (33600 bps) or V.90 (56 Kbps) modems. DSL technologies are either asymmetric or symmetric. Asymmetric provides faster downstream speeds, which is suited for Internet usage and video on demand. Symmetric provides the same rate coming and going.

Ducts – the tubes through which cables are laid.

DXC – digital cross connect (for connection to international network)

E

EC – Electronic Commerce

E-zine

(Electronic magaZINE) A magazine or newsletter published online.

Echo cancellation

The elimination of an echo in a two-way transmission. Echo is created in the telephone company's central office switch when two-wire lines from the customer are converted to four-wire lines for backbone trunks. The echo is exacerbated over longer distances and by certain kinds of network equipment. A delay of 30ms or more is generally noticeable, and 50ms is annoying. To eliminate it, the carriers put echo cancellers on their switch ports and in their long-distance trunks every 500 miles apart.

Echo suppressor

A device that turns off reverse transmission in a telephone line, thus effectively making the circuit one way. It was used to eliminate echo in long-distance circuits before more sophisticated echo cancellation techniques were economical enough to be deployed.

Electronic Data Interchange – EDI – network which allows access from different locations for transmitting orders, invoices and payments electronically. The technology used is similar to e-mail but has a higher level of security. EDI operators have computers which carry out the necessary centralised processing

Encrypt

To encode data for security purposes.

Enhanced Telecommunications Service – any telecommunications service that involves as an integral part of the service the provision of features or capabilities that are additional to the conveyance (including switching) of the information transmitted. (USA definition)

Enhanced television services – television services which include interactive applications as well as audio and video.

Epoch date

The starting point from which time is measured as the number of days, minutes, etc., from that time.

EtherLoop

(ETHERnet Local LOOP) A transmission technology from Nortel that uses Ethernet packets at up to 10 Mbps over standard telephone lines between the customer and telco central office (CO). It does not use the regular Ethernet CSMA/CD collision method. EtherLoop is a last mile technology that is said to eliminate much of the crosstalk associated with DSL.

Ethernet

The most widely-used LAN access method, which is defined by the IEEE 802.3 standard (Token Ring is the next most popular). Ethernet is normally a shared media LAN. All stations on the segment share the total bandwidth, which is either 10 Mbps (Ethernet), 100 Mbps (Fast Ethernet) or 1000 Mbps (Gigabit Ethernet). With switched Ethernet, each sender and receiver pair have the full bandwidth.

Ethernet hub

A device that all lines on an Ethernet segment are plugged into. 10BaseT and 100BaseT Ethernets are star networks and require a hub for operation. The earlier 10Base5 and 10Base2 Ethernets are bus networks, but are often wired into a star configuration using a central hub for improved troubleshooting. A hub is also known as a multiport repeater and is sometimes called a concentrator.

ETSI – European Telecommunications Standards Institute has the primary responsibility within Europe for the production of telecommunications standards for pan-European application.

European Committee for Telecommunications Regulatory Affairs (ECTRA) – ECTRA is the major European forum for the discussion of regulatory issues, set up within the framework of the European Conference of Postal and Telecommunications Administration (CEPT).

Ex-directory – a directory status classification whereby the customer's directory information is not available from any directory information services or products.

Extranet – a network connecting a group of entities using Internet protocols, but being separate from the Internet. Often parts of an organisation's internet shared with other organisations

F

F connector

A two-wire (signal and ground) coaxial cable connector used to connect antennas, TVs and VCRs. F connector cables typically carry NTSC TV signals (audio and video). The plug's shell and socket are threaded.

Fast

An asynchronous communications protocol used to quickly transmit files over high-quality lines. Error checking is done after the entire file has been transmitted.

FDDI

(Fiber Distributed Data Interface) An ANSI standard token passing network that uses optical fiber cabling and transmits at 100 Mbits/sec up to two kilometers. FDDI provides network services at the same level as Ethernet and Token Ring (OSI layers 1 and 2).

FDMA

(Frequency Division Multiple Access) The technology used in the analog cellular telephone network that divides the spectrum into 30KHz channels.

Federal Communications Commission (FCC) – the US regulatory body set up in 1934 to regulate all inter-state and foreign communications by wire, radio, television and radio. Intra-state communications are regulated by state public utilities commissions.

Fiber optics

Communications systems that use optical fibers for transmission. Fiber-optic transmission became widely used in the 1980s when the long-distance carriers created nationwide systems for carrying voice conversations digitally over optical

Fiber bundle

(1) A set of adjacent optical fibers running in parallel and adhered together. It is used for transmitting light to brighten an area as well as transmitting whole images, but not for digital communications.

(2) A collection of optical fibers.

Fibre Channel

A high-speed transmission technology that can be used as a front-end communications network, a back-end storage network, or both at the same time. Fibre Channel is a driving force in the storage area network (SAN) arena for connecting multiple hosts to dedicated storage systems.

File transfer protocol

A communications protocol used to transmit files without loss of data. A file transfer protocol can handle all types of files including binary files and ASCII text files. Common examples are Xmodem, Ymodem, Zmodem and Kermit.

Firewall

A method for keeping a network secure. It can be implemented in a single router that filters out unwanted packets, or it may use a combination of technologies in routers and hosts. Firewalls are widely used to give users access to the Internet in a secure fashion as well as to separate a company's public Web server from its internal network. They are also used to keep internal network segments secure. For example, a research or accounting subnet might be vulnerable to snooping from within.

Fixed/mobile integration – (also known as fixed mobile convergence) the merging of fixed and mobile services into an integrated service whereby the customer will be offered both fixed and mobile services and will receive one bill and/or receive and make calls using one terminal.

Fixed radio access – fixed link telecoms service that connects the network to the consumer's premises by radio instead of copper line or fibre

Frame relay service – a packet switched data service (see [packet service](#)) providing for the interconnection of Local Area Networks (LANs) and access to host computers at higher speeds (up to 2 Mbit/s) than those provided by an X.25 service.

Freephone number – a number which can be reached free of charge to the caller often beginning 0800 or 0500.

FSN

(Full-Service Network) A communications network that provides shopping, movies on demand and access to databases and a variety of online, interactive services. Telephone, cable and TV companies are positioning themselves to provide FSN services that are expected to evolve throughout the 1990s.

Full-duplex

Transmitting and receiving simultaneously. In pure digital networks, this is achieved with two pairs of wires. In analog networks or in digital networks using carriers, it is achieved by dividing the bandwidth of the line into two frequencies, one for sending, the other for receiving.

Full-duplex Ethernet

An extension to 10BaseT Ethernet that is implemented in a switched Ethernet environment, which has a dedicated line between the station and switch. It is built into the network adapter (NIC) and switch, providing

Fuzzy logic

A mathematical technique for dealing with imprecise data and problems that have many solutions rather than one. Although it is implemented in digital computers which ultimately make only yes-no decisions, fuzzy logic works with ranges of values, solving problems in a way that more resembles human logic.

G

Gateway

A computer that performs protocol conversion between different types of networks or applications. For example, a gateway can convert a TCP/IP packet to a NetWare IPX packet and vice versa, or from AppleTalk to DECnet, from SNA to AppleTalk and so on.

Geographic portability – the ability of customers to transfer their numbers between operators on fixed telecommunications networks when they switch their operator

Geographically averaged prices – prices established by averaging the costs of network elements across the country so that customers in different areas of the country do not pay different rates.

Gbits/sec

(GigaBITS per SECond) Billion bits per second.

GEO

(Geostationary or Geosynchronous Earth Orbit) A communications satellite in orbit 22,282 miles above the equator. At this orbit, it travels at the same speed as the earth's rotation, thus appearing stationary. GEOs are excellent for TV broadcasting, but produce distracting, half-second delays in interactive voice conversations, because of the long round trip from earth and back. LEOs and MEOs, which are closer to the earth, are being deployed for interactive services.

Gigabit Ethernet

An Ethernet technology that raises transmission speed to 1 Gbps. It is used primarily for backbones. The first IEEE standard (802.3z) for Gigabit Ethernet defined its use over multimode optical fiber (see below) and provides full-duplex operation from switch to end station or to another switch and half-duplex using CSMA/CD in a shared environment.

GSM

(Global System for Mobile Communications) A digital cellular phone technology based on TDMA that is widely deployed in Europe and throughout the world. GSM coverage is increasing

in the U.S. Most PCS phones use GSM and operate in the 1.8 to 1.9GHz band, compared to 800-900MHz for other cellular systems. Higher frequencies extend battery life.

Guard band

A frequency that insulates one signal from another. In an analog telephone line, the low band is 0-300; the high band is 3300-4000Hz.

H

H.221

An ITU standard for the framing structure of a videoconferencing transmission over a 64 to 1920 Kbits/sec channel.

Half-duplex

The transmission of data in both directions, but only one direction at a time. Two-way radio was the first to use half-duplex, for example, while one party spoke, the other party listened.

Handoff

Switching a cellular phone transmission from one cell to another as a mobile user moves into a new cellular area. The switch takes place in about a quarter of a second so that the caller is generally unaware of it.

Handshaking

Signals transmitted back and forth over a communications network that establish a valid connection between two stations.

Hayes

(Hayes Corporation, Atlanta, GA, www.hayes.com) A communications company specializing in modems and remote access products. Founded in 1977 by Dennis Hayes, the company pioneered personal computer communications with the design of its Smartmodem and shipped its first 300 baud model in 1978. Initially Hayes Microcomputer Products, Inc., it became Hayes Corporation in 1997 when it merged with Access Beyond, a spin-off of Penril Data Communications.

HDML

(Hand-held Device Markup Language) An abbreviated version of HTML designed to enable wireless pagers, cellphones and other hand-held devices to obtain Web pages.

Head-end – the control centre for a cable system where signals such as terrestrial and satellite TV channels are received, processed and sent for distribution down the cable system.

Host/remote concentrator – a concentrator can be remote from the host DLE or co located with it.

Host address

The physical address of a computer in a network. On the Internet, a host address is the IP address of the machine.

Hub

A central connecting device in a network that joins communications lines together in a star configuration. Passive hubs are just connecting units that add nothing to the data passing through them. Active hubs, also sometimes called multiport repeaters, regenerate the data bits in order to maintain a strong signal, and intelligent hubs provide added functionality.

I

IEEE

(Institute of Electrical and Electronics Engineers, New York, www.ieee.org) A membership organization that includes engineers, scientists and students in electronics and allied fields. Founded in 1963, it has more than 300,000 members and is involved with setting standards for computers and communications.

IBC – Integrated Broadband Communications

IN – Intelligent Network. A telecommunications network in which the network intelligence is centralised and separated from the switching function.

In-the-clear television service – television services that are broadcast without scrambling and are thus, accessible by all viewers within the reception area who have the necessary equipment. In-the-clear services are a sub-set of free-to-air services.

Indefeasible Right of Use (IRU) – effectively, ownership of capacity on an international cable by someone other than an original member of the cable consortium.

Independent Service Provider (ISP) – entities which provide telecommunications services over fixed or mobile networks, or services with a telecommunication service component, to the public at large but do not own or operate telecommunications networks. Some independent service providers may not use telecommunication networks eg they may be publishers of printed directories.

Indirect access – where a customer's call is routed and billed through operator A's network even though the call originated from the network of operator B. It is the generic term for both easy access and equal access

Individual licence – an authorisation which is granted by a national regulatory authority and which gives an undertaking specific rights or which subjects that undertaking's operations to

specific obligations supplementing the general authorisation where applicable, where the undertaking is not entitled to exercise the rights concerned until it has received the decision by the national regulatory authority.

Inductive Coupling – sometimes known as magnetic coupling, it is the principle by which a coil within a hearing aid picks up audio frequencies by means of the magnetic field generated by telephone handsets, loudspeakers or other similar equipment (eg inductive loops).

Integrated Services Digital Network (ISDN) – a network based on the existing digital PSTN which provides digital links to customers and end to end digital connectivity between them. ISDN2 provides a maximum bandwidth of 128kbit/s.

Intelligent hub

A central connecting device in a network that performs a variety of processing functions such as network management, bridging, routing and switching.

Intelligent modem

A modem that responds to commands and can accept new instructions during online transmission. It was originally developed by Hayes.

Intelligent Network – a telecommunications network in which the network intelligence is centralised and separated from switching functions. These allow more flexibility than switched based systems, customers can be given access to their own database entries to carry out changes

Interconnection – the physical and logical linking of telecommunications networks used by the same or a different organisation in order to allow the users of one organisation to communicate with users of the same or another organisation, or to access services provided by another organisation. Services may be provided by the parties involved or other parties who have access to the network.

Interconnection – interconnection means the physical and logical connection of two operators networks thereby allowing customers of one system to connect with customers of the other, or to access services provided from the other system.

Interconnection Directive (ICD) – an EU Directive which came into effect from January 1995, setting rules for, amongst other things, who has rights and obligations to interconnect and the terms on which it should take place.

Internet – a global network of networks, mainly narrowband, accessed by users with a computer and a modem via a service provider.

Internet address

There are two kinds of addresses that are widely used on the Internet. One is a person's e-mail address, and the other is the address of a Web site, which is known as its URL. Following is an explanation of Internet e-mail addresses.

Internet service provider – a service provider who provides access to Internet services.

Interoperability – interoperability means the technical features of a group of interconnected systems (>systems includes equipment owned and operated by the customer which is attached to the public telecommunication network) which ensure end-to-end provision of a given service in a consistent and predictable way.

Intranet – closed data network linking a number of sites using standard internet protocols

IP address

(Internet Protocol address) The address of a computer attached to a TCP/IP network. Every client and server station must have a unique IP address. Client workstations have either a permanent address or one that is dynamically assigned to them each dial-up session. IP addresses are written as four sets of numbers separated by periods; for example, 204.171.64.2.

ISDN

(Integrated Services Digital Network) An international telecommunications standard for transmitting voice, video and data over digital lines running at 64 Kbps. The telephone companies commonly use a 64 Kbps channel for digitized, two-way voice conversations. ISDN service is available in most parts of the U.S.

ISDN modem

An alternate name for ISDN terminal adapter. The term is widely used, because the unit looks like a modem and connects to the same serial port as a modem. It is also easier to say. However, since ISDN is digital, the device does not MODulate or DEModulate any signal.

Isochronous

Time dependent. Realtime voice, video and telemetry are examples of isochronous data.

J

Jack

A receptacle into which a plug is inserted.

Jtter

A flickering transmission signal or display image.

Jmper

The simplest form of an on/off switch. It is just a tiny, plastic-covered metal block, which is pushed onto two pins to close that circuit. It is used to select myriads of functions on a printed circuit board or on a peripheral device. For example, on a PC, jumpers are used to select I/O addresses and IRQs. On an IDE drive, a jumper selects between master and slave.

K

Kbits/sec

(KiloBITS per SECond) One thousand bits per second. See kilo.

KHz

(KiloHertz) One thousand cycles per second. See

Kingston – Kingston Communications (Hull) PLC – telephone company which operates in the Hull area.

L

LEO – Low Earth Orbit

Last mile

The connection between the customer and the telephone or cable company. The last mile is made of copper-based telephone wire or coaxial cable. See local loop.

Layered architecture

An architecture in which data moves from one defined level of processing to another. Communications protocols are a primary example. See OSI model.

LDAP

(Lightweight Directory Access Protocol) A protocol used to access a directory listing. LDAP support is being implemented in Web browsers and e-mail programs, which can query an LDAP-compliant directory. It is expected that LDAP will provide a common method for searching e-mail addresses on the Internet, eventually leading to a global white pages.

Legacy LAN

A LAN topology, such as Ethernet or Token Ring, that has a large installed base.

LEO

(Low-Earth Orbit) A communications satellite in orbit some 500 to 600 miles above the earth. Being much closer than 22,282 mile-high geosynchronous satellites (GEOs), LEO signals make the round trip from earth much faster. Thus, low-powered pizza dishes and hand-held devices can be used. LEOs are also better suited to interactive conferencing. Unlike GEOs, which travel at earth speed, LEOs revolve around the globe every couple of hours, and any single LEO is in view for only a few minutes. In order to maintain continuous communications, multiple LEOs must be used.

Line of sight

An unobstructed view from transmitter to receiver.

LMDS

(Local Multipoint Distribution Service) A digital wireless cable system that provides two-way transmission in the 28GHz range. It uses line of sight and requires a transmitter every couple of miles. LMDS provides greater upstream bandwidth than MMDS and other wireless services. It is expected to be used for wireless data services and Internet access.

Local area networks (LANS) – a network allowing the interconnection and intercommunication of a group of computers, primarily for the sharing of resources and exchange of information (eg e-mail)

Lead-in duct – is defined as the primary route or routes leading from BT's off-site network onto the site.

Leased lines (also known as private circuits) a fixed unswitched communication link between two points.

Local loop – the access network connection between the customers premises and the local PSTN exchange, usually a loop comprised by two copper wires.

Local rate – the rate for calls within the local area, the area being defined by the telecommunications operator serving the customer.

M

MAC layer

(Media Access Control layer) The protocol that controls access to the physical transmission medium on a LAN. The MAC layer is built into the network adapter. Common MAC layer standards are the CSMA/CD architecture used in Ethernet and the token passing methods used in Token Ring, FDDI and MAP. The MAC layer is synonymous with the data link layer in the OSI model.

Main distribution frame – the apparatus in the local concentrator (exchange) building where the copper cables terminate and cross connection to other apparatus can be made by flexible jumpers.

MAN – Metropolitan Area Network

Manchester Code

A self-clocking data encoding method that divides the time required to define the bit into two cycles. The first cycle is the data value (0 or 1) and the second cycle provides the timing by shifting to the opposite state.

Marginal price – the difference between the price of the bundle including a given service and the price of the bundle (which may consist of only one service) without the service concerned. When products are sold as a bundle the marginal price will not be equal to the incremental revenue attributable to the service in question

MBit/s – Mega (million) bits per second. A measure of the speed of transfer of digital information.

MEO

(Medium-Earth Orbit) A communications satellite in orbit some 6,000 miles above the earth, which is higher than a LEO and lower than a GEO. MEOs take six hours to orbit the earth and are in view for a couple of hours.

MHz

(MegaHertz) One million cycles per second. It is used to measure the transmission speed of electronic devices, including channels, buses and the computer's internal clock. Megahertz is generally equivalent to one million bits per second or to one million times some number of bits per second.

Migration – the movement of telephone numbers from one range (often a non-specified range) to another (specified) range.

Minimum carriage obligation – a contractual obligation to carry channels to a minimum percentage of a cable operator’s subscriber base. Normally these are set at between 80 and 100 per cent of subscribers. such obligations are a form of risk–sharing between broadcaster and cable operator reflecting the need on the part of the channel provider to recover its fixed costs.

MIU – Minimum Investment Unit (smallest unit of cable capacity that can be sold – currently 2Mb link)

MMC – Monopolies and Mergers Commission.

Mobile data – covers a wide range of niche applications including vehicle location systems, data information services.

Mobility management – a service whereby a customer’s calls can be forwarded to different locations depending on the customer’s movements, together with an operator or message–leaving service if calls cannot be connected to the customer.

Mobile portability – where a customer taking a service from a mobile operator (eg Vodafone, Orange) or Service Provider (eg People’s Phone) can retain their telephone number when they change to a different mobile operator or service provider.

Modem – a device which converts digital signals from a data–transmitting terminal into modulated analogue signals which can be carried by a public telephone network.

MPPP

(MultiLink PPP) An extension to the point-to-point protocol that enables two channels to be linked together to double the throughput. It is used for ISDN transmission and channel bonding.

Multiplexing

Transmitting multiple signals over a single communications line or computer channel. The two common multiplexing techniques are FDM, which separates signals by modulating the data onto different carrier frequencies, and TDM, which separates signals by interleaving bits one after the other.

N

Narrowband – a service or connection allowing only a limited amount of information to be conveyed, such as for telephony. This compares with broadband which allows a considerable amount of information to be conveyed.

Near video–on–demand – the transmission of a film or TV programme over several channels at the same time but with a short delay (eg of 15 minutes) between the screening on each successive channel to give the customer a choice of viewing times. It aims to approach the functionality of pure video–on–demand which allows the customer complete control over the time the film is watched.

Network Futures Group (NFG) – an Industry Committee formed to advise OFTEL and the industry on generic issues associated with interconnection and interoperability.

Network interconnection services – network services that are sold to other network operators.

Network Termination Point (NTP) – the edge of a network at which the network is connected to other networks or to terminal apparatus, eg a telephone.

Network Termination and Testing Apparatus (NTTA) – a piece of apparatus forming part of a public network but situated in a fixed position on customer premises which enables equipment that is not part of a public network to be readily connected to or disconnected from a public network.

Nibble

Half a byte (four bits).

Null modem cable

An RS-232 cable used to connect two personal computers together in close proximity for file transfer. It attaches to the serial ports of both machines and simulates what would occur naturally if modems and the phone system were used. It crosses the sending wire with the receiving wire. A counterpart special cable is also available that uses the parallel port for higher transfer speed.

Number mobility – the ability to take a geographic telephone number with you when changing address.

Numbering Directive – an EU Directive in the course of adoption which creates the EU CPS obligation. The Numbering Directive's provisions will be included as amendments to the interconnection Directive.

NVOD – Near Video On Demand

O

OC

(Optical Carrier) The transmission speeds defined in the SONET specification. OC defines transmission by optical devices, and STS is the electrical equivalent.

OFT – The Office of Fair Trading.

One End Breakout – use of the network which involves breakout onto the public telecommunications network only at one end. For example, an operator in the UK could collect traffic on leased lines, switch it to a leased line for onward transit to the destination country, and then break out onto the public telecommunication network there. Alternatively an operator in a foreign country could collect traffic off a private network abroad, and terminate it on the public telecommunications network in the UK.

Open Systems Interconnection (OSI) model – a standard, created by the International Standards Organisation (ISO) in 1983 which classifies data transfer protocols into 7 layers, according to the function they perform, with a view to promoting compatibility between systems. The raw copper loop is below Layer 1 and is described in this document as “Layer 0”.

Optical Fibre – cable made of glass fibres through which signals are transmitted as pulses of light. It is a broadband medium that can easily provide capacity for a large number of channels.

Opti-Jack

A Fiber Jack fiber-optic connector from Panduit Corporation, Tinley Park, IL, (www.panduit.com), that provides a snap-lock plug and socket for a pair of fiber cables. It enables fibers to be quickly plugged and removed in a manner similar to RJ-45 connectors.

Optical amplifier

A device that boosts light signals in an optical fiber. Unlike regenerators, which have to convert the light signal to electricity in order to amplify it and then convert it back to light, the optical amplifier amplifies the light signal itself. The rare earth material, erbium, is used for creating the first successful optical amplifiers.

Optical switch

An all-optical fiber-optic switching device that maintains the signal as light from input to output.

OSI

(Open System Interconnection) An ISO standard for worldwide communications that defines a framework for implementing protocols in seven layers. Control is passed from one layer to the next, starting at the application layer in one station, proceeding to the bottom layer, over the channel to the next station and back up the hierarchy.

P

Packet

A block of data used for transmission in packet switched systems. The terms frame, packet and datagram are often used synonymously.

Packet service – a service involving the transmission of data in the form of discrete blocks (packets) of information and, if necessary, the assembly and disassembly of data in this form.

Packet switching

A networking technology used in wide area networks (WANs) that breaks up a message into smaller packets for transmission and switches them to their required destination. Unlike circuit switching, which requires a constant point-to-point circuit to be established, each packet in a packet switched network contains a destination address. Thus all packets in a single message do not have to travel the same path. They can be dynamically routed over the network as circuits become available or unavailable. The destination computer reassembles the packets back into their proper sequence.

Parallel running – when both the old and the new numbering arrangements run alongside each other leading up to an actual number change. It allows customers a transition period to get used to the new arrangements.

PBX

(Private Branch eXchange) An inhouse telephone switching system that interconnects telephone extensions to each other, as well as to the outside telephone network. It may include functions such as least cost routing for outside calls, call forwarding, conference calling and call accounting.

PCN – Personal Communications Network – high capacity digital cellular networks. (Orange and Mercury 1–2–1 are the current UK PCN operators).

Personal data – definition used in Data Protection Act 1984 to mean information recorded on computer about living identifiable individuals. Directory information on residential customers and some business customers (partnerships and sole traders) is personal data.

Personal numbers – a user with a personal number can instruct all calls to that number to be diverted to any other number (including a voice mail box).

Photonics

The science of building machine circuits that use light instead of electricity.

Physical address

The actual, machine address of an item or device.

Point-to-point

A communications network that provides a path from one location to another (point A to point B).

PPP

(Point-to-Point Protocol) A data link protocol that provides dial-up access over serial lines. It can run on any full-duplex link from POTS to ISDN to high-speed lines (T1, T3, etc.). Developed by the Internet Engineering Task Force in 1991, it has become popular for Internet access as well as a method for carrying higher level protocols.

Porting, Ported – keeping the same number when transferring from one operator to another.

Port switching hub

An intelligent network hub that attaches to multiple LAN segments. Via software, it allows the station ports to be connected to one of the segments. This is a type of virtual LAN, because one LAN segment can be located on different floors or geographic locations.

Presentation layer

The services in the OSI protocol stack (layer 6 of 7) that provide conversion of codes and formats for the communications session.

PRI – Primary Rate Interface

Price floor – the level which BT must price at or above if its prices are not to be regarded as anti-competitive.

Prioritised circuit bumping – displacement of lower priority information being carried by a circuit with information of a higher priority.

Private circuits – (also known as leased circuits) point-to-point circuits for customers exclusive use covering speech, data or image communications.

Protocol conversion – protocols are sets of rules that govern the exchanges between two telecommunication systems for the purpose of transferring information (signalling or data). Protocol conversion is where one set of rules is converted to another set of rules, to enable entities using different rules to exchange information.

Protocol stack

The hierarchy of protocols used in a communications network. Network architectures designed in layers, such as TCP/IP, OSI and SNA, are referred to as stacks.

Public Switched Telephone Network – PSTN – the telecommunications networks of the major operators, on which calls can be made to all customers of all PSTNs.

Public telecommunications network – a telecommunications network used, in whole or in part, for the provision of publicly available telecommunications services

R

Radio

The transmission of electromagnetic energy (radiation) over the air or through a hollow tube called a waveguide. Although radio is often thought of as only AM or FM, all airborne transmission is radio, including satellite and line-of-sight microwave.

Radio in Local Loop – the technical approach of providing customer connection to the public network via a fixed radio link from the home or premises to the local exchange, instead of providing a “wired” connection using copper cables or optical fibre.

Radio Spectrum – the range of wavelengths used, for example, for broadcasting radio, terrestrial television and satellite television. Usable wavelength ranges from about 100 KHz to about 400 GHz although there are as yet no broadcasts above about 12 Ghz.

Remote echo

The transmission of received data back to the sending station for visual verification. A local echo displays the typed keystrokes from the local machine, but a remote echo displays the data after it has been sent, received and retransmitted back.

Repeater

(1) A communications device that amplifies or regenerates the data signal in order to extend the transmission distance. Available for both analog and digital signals, it is used extensively in long distance transmission. It is also used to tie two LANs of the same type together. Repeaters work at layer 1 of the OSI model. See bridge and router.

(2) The term may also refer to a multiport repeater, which is a hub in a 10BaseT network.

RF shielding

A material that prohibits electromagnetic radiation from penetrating it. Personal computers and electronic devices used in the home must meet U.S. government standards for electromagnetic interference.

RFC 1490

A standard for forwarding SNA and LAN traffic over a wide area frame relay network. RFC 1490 followed DLSw, which was a de facto standard; however, RFC 1490 was widely adopted at the onset. It is expected to support other WAN technologies in the future.

Ring Back When Free – a Network Service enabling a caller who has attempted to make a call to a number that is engaged to be alerted by the network when that number becomes available for connection.

RJ-11

(Registered Jack-11) A telephone connector that holds up to four wires. The RJ-11 the common connector used to plug the handset into the telephone and the telephone into the wall. A six-wire variation of RJ-11 is also used.

RJ-45

(Registered Jack-45) A telephone connector that holds up to eight wires. RJ-45 plugs and sockets are used in 10BaseT Ethernet and Token Ring Type 3 devices.

Router

A device that forwards data packets from one local area network (LAN) or wide area network (WAN) to another. Based on routing tables and routing protocols, routers read the network address in each transmitted frame and make a decision on how to send it based on the most expedient route (traffic load, line costs, speed, bad lines, etc.). Routers work at layer 3 in the protocol stack, whereas bridges and switches work at the layer.

RS-232

(Recommended Standard-232) A TIA/EIA standard for serial transmission between computers and peripheral devices (modem, mouse, etc.). It uses a 25-pin DB-25 or 9-pin DB-9 connector. Its normal cable limitation of 50 feet can be extended to several hundred feet with high-quality cable.

S

Scrambling – the act of encoding a signal (eg a TV programme) so that it can only be accessed by those customers with the necessary decoding equipment.

SCSI

(Small Computer System Interface) Pronounced "scuzzy." SCSI is a hardware interface that allows for the connection of up to seven or 15 peripheral devices to a single expansion board that plugs into the computer called a SCSI host adapter or SCSI controller. Single boards are also available with two controllers and support up to 30.

SDH

(Synchronous Digital Hierarchy) The European counterpart to SONET. See SONET.

Service provider – provider of telecommunication services, or services with a telecommunication service component, to third parties whether over its own network or otherwise.

Sidecar channel – a channel which is sold as an adjunct to a premium channel in order to carry more than one event simultaneously (eg two sporting events).

Signalling Point Codes – codes used by operators for internal routing purposes, ie, to enable telephone switches to identify one another when routing calls over telecommunications networks.

Single tandem conveyance – a BT service provided to interconnect network operators whereby a call passed on to BT's network at a "tandem exchange" (ie one that routes calls between exchanges but not having direct connections to end users) is passed on to a local exchange and then on to the end user.

Sites in multiple occupation – are defined as sites where BT has contractual commitments for network services to more than one customer.

Sites in single occupation – sites in single occupancy where BT has only one set of contracts with one customer for network services to that customer on that site.

Slamming – the practice of changing a customer's pre-selected carrier without their express permission.

SMATV – Satellite master antenna television. A narrowband local television-only system operating under a class licence.

SMDS – Switched multi-megabit data service – a public switched broadband data service providing inter-site connectivity of, for example, Local Area Networks (LANs), and mainframe computers, at multi-megabit speeds (ie faster than available with Frame Relay).

SONET

(Synchronous Optical NETWORK) A fiber-optic transmission system for high-speed digital traffic. Employed by telephone companies and common carriers, SONET speeds range from 51 megabits to multiple gigabits per second. SONET is an intelligent system that provides advanced network management and a standard optical interface. It uses a self-healing ring architecture that is able to reroute traffic if a line goes down. SONET backbones are widely used to aggregate lower-speed T1 and T3 lines.

Standards

Standards is the most important issue in the computer field. As an unregulated industry, we have wound up with thousands of data formats and languages, but very few standards that are universally used. This subject is as heated as politics and religion to vendors and industry planners.

Switched – relates to a telecommunications network comprising at least one exchange and capable of routing signals and messages from one line to all other lines comprised in the network.

Switch-to-computer

To integrate voice telephone and database access. For example, in customer service applications, using telephone services, such as automatic number identification (ANI) and automatic call distribution (ACD), an incoming call can retrieve and route the customer's file to the next available human agent.

System – the computers and associated software and software interfaces which provide the facilities and arrangements for enabling transactions etc.

Synchronous Digital Hierarchy (SDH) – a method of telephony transmission using digital techniques where the data is packed in containers which are synchronised in time enabling relatively simple modulation and demodulation at the transmitting and receiving ends. The technique is used to carry high capacity voice circuits over long distances.

T

T-carrier

A digital transmission service from a common carrier. Introduced by AT&T in 1983 as a voice service, its use for data has grown steadily. T1 and T3 lines are widely used to create point-to-point private data networks. T-carrier lines use four wire cables. One pair is used to transmit; the other to receive.

T1

A T1 line provides 24 64-Kbps voice or data channels. The standard T1 frame is 193 bits long, which holds 24 8-bit voice samples and one synchronization bit with 8,000 frames transmitted per second. There is a whole family of T standards.

Tbits/sec

(TeraBITS per SECond) Trillion bits per second.

TACS – Telecommunications Advisory Committees – independent regional advisory bodies set up by OFTEL.

TCP/IP stack

An implementation of the TCP/IP communications protocol. Network architectures designed in layers, such as TCP/IP, OSI and SNA, are called stacks.

TDAB – Terrestrial Digital Video Broadcasting

TDVB – Terrestrial Digital Video Broadcasting

Telecommunications Services Licence (TSL) – a class licence under which individuals can offer certain telecommunications services including a private payphone service. The licence authorises the connection of up to 20 sites by self-provided lines, or an unlimited number by leased lines.

Terminal portability – the ability for customers to transfer their terminal apparatus (eg a telephone) to another public network without any loss of interoperability.

TEURIM – the asymmetric accounting rate system used in Europe and the Mediterranean, where the lack of symmetry is intended to reflect the differing cost elements in each country.

Time of day routing – the routing of calls to different destinations depending on the time of day or the day of the week, according to instructions held in the network that relate to a particular customer. For example, an organisation may wish to advertise a single telephone number but have incoming calls directed to different locations at different times. Such routing usually requires use of a number translation service.

Token bus network

A LAN access method that uses the token passing technology. Stations are logically connected in a ring but are physically connected by a common bus. All tokens are broadcast to every station in the network, but only the station with the destination address responds. After transmitting a maximum amount of data, the token is passed to the next logical station in the ring. The MAP factory automation protocol uses this method.

Token Ring

A local area network (LAN) developed by IBM (IEEE 802.5). It uses a token ring access method and connects up to 255 nodes in a star topology at 4 or 16 Mbps. All stations connect to a central wiring hub called the MAU (Multistation Access Unit) using a twisted wire cable. The central hub makes it easier to troubleshoot failures than a bus topology. This is a different type of hub than the one used in 10BaseT twisted pair Ethernet networks.

Transcontrol – the process of converting digital television services from the format provided by on broadcaster into a format such that it can be re-transmitted by another broadcaster.

Transport layer

The services in the OSI protocol stack (layer 4 of 7) that provide end-to-end management of the communications session.

Tromboning – sending traffic which comes from a fixed and is destined for a mobile network in the same country via a second country to take advantage of beneficial accounting rates for termination of international traffic on mobile networks

Trunk network – that part of a telecommunications network which provides connections between customer-serving exchanges.

Twisted pair

A thin-diameter wire (22 to 26 gauge) commonly used for telephone wiring. The wires are twisted around each other to minimize interference from other twisted pairs in the cable. Twisted pairs have less bandwidth than coaxial cable or optical fiber.

U

UMTS – Universal Mobile Telecommunications System – so called 3rd generation mobile communications system which will provide enhanced range of multimedia services (eg video, high speed internet access).

Unimodem

A driver from Microsoft that provides common telephony services for Windows applications that access data and fax modems. Unimodem is a Telephony Service Provider (TSP) that accepts calls written to the TAPI interface and commands the modem directly.

UXD5 exchange – a small digital rural exchange used in parts of Wales and Scotland, which has limited facilities.

V

VADSL

(Very high bit rate Asymmetric DSL) An earlier name for VDSL. See DSL.

Vertical Integration – where a single company is active in more than one stage in the production and supply of a good or service eg where a network operator also provides enhanced services which are carried over the network or supplies the consumer equipment needed to access services it provides.

Videotex – a service allowing specially adapted televisions to display text-based information retrieved from a central database via the PSTN.

Voice mail – facility to leave a voice message which can be accessed from different locations.

Voice telephony service – a service available to the public for the commercial provision of direct transport of real-time speech via the public switched network or networks such that any user can use equipment connected to a network termination point at a fixed location to communicate with another user of equipment connected to another termination point.

VPN – Virtual Private Network these are used by a company or private group to make inter-site connections either for telephone speech or data as if there were dedicated leased lines between these sites. The equipment used is located within the public telecommunications operators' premises and forms an integral part of the public network but is software-partitioned to allow for a genuinely private network

VSAT – Very Small Aperture Terminal, digital satellite data network with small antenna diameter

WXYZ

WANS – Wide area networks – a network allowing the interconnection and intercommunication of a group of computers over a long distance

Web address

The URL of a page on the Web; for example, www.computerlanguage.com.

WEO – Well Established Operator – a regulatory concept applied in the context of specific product markets. A WEO is an operator with 25% or more of what is in the opinion of the Director General the relevant market, unless the Director General determines that the operator is not a WEO, or an operator with less than 25% of what is in the opinion of the Director General the relevant market which is determined by the Director General to be a WEO.

Wholesale interactive services – the ability to offer retail goods and services to the end customer rather than the goods or services themselves.

Wholesale service provider – the organisation which provides the computer servers, needed for the playout of video and data and the reception and processing of responses from consumers via modem. The wholesale service provider might also provide other services to retailers and retail service providers such as design and writing applications.

Wideband – an intermediate bandwidth without the fuller capacity of broadband.

Wireless

Radio transmission via the airwaves. Various communications techniques are used to provide wireless transmission including infrared line of sight, cellular, microwave, satellite, packet radio and spread spectrum.

X.25

An ITU standard (1976) for packet switching networks. Public X.25 communications networks have been available worldwide for many years, which provide a switched data service at 56 Kbps or less. Such networks are widely used for point of sale (POS) terminals, credit card verifications and automatic teller machine (ATM) transactions. New packet-switched networks employ frame relay and SMDS technologies rather than X.25.

X.32

An ITU standard (1984) for connecting to an X.25 network by dial up. It defines how the network identifies the terminal for billing and security purposes and how default parameters are negotiated for the connection.

Xmodem

The first widely-used file transfer protocol for personal computers, developed by Ward Christensen for CP/M machines. Xmodem programs typically support the earlier checksum method and the subsequent CRC method of error detection. Xmodem transmits 128-byte blocks. Xmodem-1K improves speed with 1KB blocks. Xmodem-1K-G transmits without acknowledgment for error-free channels or when modems are self correcting, but transmission is cancelled upon any error.

Ymodem

A file transfer protocol that adds batch file processing to Xmodem. Multiple files can be sent at the same time. It is faster than Xmodem and sends the file name before sending the data. Ymodem-G transmits without acknowledgment for error-free channels or when modems are self correcting, but transmission is cancelled upon any error.

Zmodem

A file transfer protocol that has become very popular because it handles noisy and changing line conditions very well, including satellite transmission. It sends file name, date and size first, uses variable length blocks and CRC error correction.